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ABSTRACT

This report summarizes the results of Harvard University's academic planning process that took place from 1991 to 1993. An introduction outlines the process's basic goals: (1) to maintain and strengthen Harvard's excellence in education and research and to sustain its leadership position; (2) to remain open and accessible to the most outstanding students and scholars of all backgrounds and points of view; and (3) to serve society by helping to address the most important problems that confront the nation and the larger world. Part I of the report describes the planning process, discusses major trends for change that challenge the University, and defines guiding purposes and parameters. Part II discusses the Arts and Sciences, specifically college life and its curriculum, residential life, and teaching; fields of knowledge, and major projects planned. Part III addresses the professional schools at Harvard and examines professional education in general and specific initiatives. Part IV describes university-wide efforts in internationalization, inter-faculty initiatives, and libraries and information technology. Part V examines how to keep Harvard open and accessible to people of all backgrounds and points of view and particularly discusses the College, the graduate and professional schools, and faculty and staff diversity. Part VI is a conclusion. A necrology of recently deceased faculty members and overseers is attached. (JB)

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THE PRESIDENT'S REPORT

1991–1993

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HARVARD UNIVERSITY

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THE PRESIDENT'S REPORT

1991–1993

HARVARD UNIVERSITY

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Part I. Harvard: The Years Ahead

I. INTRODUCTION

> True enlargement of mind . . . is the power of viewing many things at once as one whole. . . . It makes every thing in some sort lead to every thing else; it would communicate the image of the whole to every separate portion, till that whole becomes in imagination like a spirit, every where pervading and penetrating its component parts, and giving them one definite meaning.
>
> John Henry Cardinal Newman
> *The Idea of a University* (1852)

I HAVE THE HONOR to submit to the Board of Overseers this report, which summarizes the results of Harvard's academic planning process—a process that has been under way for the past two academic years.

In the pages that follow, I have concentrated on general topics that are important to the university as a whole. Many specific proposals and objectives are also discussed, some of which are particular to Harvard's individual Faculties and Schools, as well as other units. But, inevitably, in a document like this, the main approach must be broad in nature.

Few people question the central importance of excellent higher education and research to society as well as to individuals. The questions we face do not concern the necessity of these activities, so much as the ways in which they should be organized and carried forward. Which values are essential for us to affirm and protect? Which fields of knowledge are most significant and promising? Which problems in our society and world can benefit most from the research, teaching, and other contributions that universities can make?

There are also more specific questions. How should we structure the future relationship between teaching and research, in order to create the most fruitful environment for learning—by

students and faculty, at all levels and in all fields? How can we maintain broad access to private higher education, and ensure its affordability? How will we sustain the unity and coherence of institutions that are fully committed to free inquiry and expression, and that bring together thousands of people whose backgrounds and perspectives are so remarkably diverse?

These questions defy simple answers. But we have tried to take full account of them in our planning sessions, and to formulate our general purposes and our concrete proposals with such challenges in mind. In beginning this report, I want to start with a brief summary of our basic goals:

- To maintain and strengthen Harvard's excellence in education and research, and to sustain its leadership position among great universities here and abroad. We will not flourish, as a nation or a civilization, unless we ensure the flow of creative and tested ideas—as well as the stream of exceptional graduates—that our universities and colleges provide and that society requires.

- To remain open and accessible to the most outstanding students and scholars of all backgrounds and points of view. Education is the most powerful means to individual opportunity and achievement in our society, and Harvard must continue to ensure broad access to such opportunity, in a climate that both welcomes diversity and vigorously protects freedom of expression and thought.

- To serve society by helping to address the most important problems that confront the nation and the larger world. Through the work of our faculty and students, by old methods and new, we must participate even more fully in the task of confronting the difficult dilemmas that now face society.

Excellence, openness, service: these are our touchstones.

To remain faithful to them, we must continue to attract the finest faculty that can possibly be assembled. The faculty remain at the heart of the university, our most constant source of energy and commitment. No less, we must enroll the most talented students, from all backgrounds, and offer support to those in need. The doors of Harvard must remain open. We must also sustain

the exceptional quality and dedication of our staff. Their efforts are crucial to everything we do. And we must make sure that our libraries, laboratories, and other physical resources remain excellent, so that our faculty and students can continue to undertake the most advanced and stimulating work possible.

Achieving these goals will require us to press forward with some of the new institutional approaches and shifts in emphasis already under way. We need to bring Harvard's distinct Schools and departments closer together, especially in those areas where it is essential for us to plan and act more as a single institution, rather than as a confederation of separate parts. We need to focus less on expansion and more on integration—on developing our capacities to coordinate, to consolidate, and to improve the programs we already offer and the resources we already possess.

2. PROCESS AND PLANNING

For the past two years, Harvard has engaged in an intensive and unprecedented process of university-wide planning. The deans of all nine Faculties,* together with the president, the provost, the vice presidents, the president of Radcliffe, and others, have together undertaken a full review of our programs and purposes, our intellectual and financial situation, and our priorities and needs for the future. The emerging plans—academic, administrative, financial—are rooted firmly in the distinctive characteristics of the several Schools. Yet together, they chart a course for the university as a whole.

Harvard's existing institutional structure provides a strong and indispensable foundation. It vests each individual unit with primary responsibility for its programs, finances, and administration. This approach generates a strong sense of self-discipline and healthy entrepeneurship. Those qualities have served Harvard remarkably well for many decades, and they will be no less important in the future.

* Arts and Sciences, Business, Design, Divinity, Education, Government, Law, Medicine (including Dentistry), and Public Health. Throughout this report, I use the terms "Faculty" or "School" to refer to these constituent parts of Harvard.

More and more, however, we are called upon to plan and act as a single institution. In this regard, our capacities have traditionally been less well developed. If, for example, we aim to address intellectual problems that cross disciplinary lines, or to strengthen teaching programs that integrate different fields of knowledge, or to develop master plans for our libraries or computer systems or physical facilities, or to ensure consistent human-resources policies across the university—if we wish to achieve these and many other aims, we have no choice but to buttress those structures and processes that can provide for more regular consultation and more collaborative decision making. Otherwise, we cannot make difficult choices about university-wide needs and priorities in an informed and systematic way.

Our planning process, involving dozens of meetings over the past two years, has itself introduced an important new structure of this kind. Without the regular and collaborative involvement of the deans, various faculty members, and others—reviewing the plans of the different Schools and other units as they have developed—it would not have been possible to arrive at a coherent framework and set of directions for the university as a whole. Regular meetings of the Academic Council (including the president and provost, the deans and vice presidents, and the president of Radcliffe) have provided another forum for focusing on matters of broad institutional significance. And the new Office of the Provost, with the appointment of Jerry Green, considerably enhances our capacity to coordinate and focus our efforts in areas of university-wide concern.

The purpose of these efforts and others is not to centralize staff and functions. It is to build on Harvard's basic organizational strength, while also creating more systematic ways to draw on the experience and advice of the deans and other officers; to forge stronger links, at all levels, among different parts of Harvard; and to improve our ability to make decisions that are informed by and sensitive to both the variety of perspectives within our community and the interests of the university as a whole.

3. TRENDS AND REALITIES

TO PLAN RESPONSIBLY FOR ITS FUTURE, a university must of course consider some of the broader societal trends that bear on higher education. Our planning process has taken account of a number of such trends and related assumptions. Here, let me briefly describe a few of the most significant ones:

First, the sheer volume of available information and knowledge is growing at an unprecedented pace, and is likely to continue to do so. This phenomenon presents universities with a number of new challenges and opportunities—or old ones that appear in a new and different light. In an era of such accelerated growth in information and knowledge, and such constrained resources, how do we choose which fields of learning to pursue, and which to forgo? How can we incorporate so much new information and knowledge into our teaching and research, and yet maintain programs that are coherent and manageable in design—and affordable in cost? How do we decide which materials and equipment to acquire, and which to do without? How can we put new technologies to the most productive and efficient use? Even within Harvard, the answers will vary from School to School, but the questions are common to all. And the shared perspectives of each are helping us find more creative and cooperative ways to deal with the growth of information and knowledge, as well as the dramatic changes in how it can be accessed, delivered, and used.

Second, the extent to which we lead lives that are increasingly international is not likely to diminish; indeed, it seems certain to grow. For universities, this development goes beyond the question of how many students to accept from other countries, or how many students to send abroad; how many "international courses" to offer, and how much international research to undertake. It involves an irreversible change in our consciousness—caused by the instantaneous nature of modern communications, the availability (and relative affordability) of rapid transportation, and the interconnectedness of our contemporary world. Places that once seemed remote and scarcely relevant to our daily lives now affect us visibly and often powerfully every day.

Here again, a long-standing challenge—how to conceive and structure the university's international agenda—appears in a new and different light. The study of individual countries and regions will obviously remain very important. But, in both research and teaching, we are increasingly called on to understand complex interactions and dynamics that transcend traditional regional boundaries, whether the issues involve international trade and finance, global climatic change, the spread of deadly diseases, the persistence of ethnic and racial conflict, or the changing roles of women in different societies. And so, as we plan, we must strengthen our international work not only in well-established geographic patterns, but also along thematic lines that cut across regional bounds. This will have profound implications for what subjects we choose to study and teach, how we structure our programs of teaching and research, and even how we configure our physical space.

Third, many of our most significant institutions, both domestic and international, are under great stress—stress that is serious enough to threaten their capacity to fulfill their basic functions. Some of our more established domestic institutions—our public schools, our health-care system, our major cities, our manufacturing industries—are more beleaguered than at any time in recent memory. Some less established institutions in the international arena (such as fledgling democracies abroad, or multilateral forces charged with combatting aggression or keeping the peace) face uncertainties and difficulties that often seem to deepen, not lessen, with the passage of time. To study and help address the problems of such institutions is one of the most important challenges of our era, and one that universities must help find appropriate ways to meet.

From one point of view, our most important contributions are our most traditional ones: to study issues of intellectual and human significance; to publish the fruits of our research, and create forums for discussion and debate; and to help students develop into leaders who can understand and improve the complex, large-scale systems and institutions that now exist.

Yet there is an increasing recognition that universities must intensify their efforts, and seek new ways of addressing many of society's most pressing problems—especially because the solution

of these problems will require knowledge drawn from a variety of disciplines. How, for instance, can we adequately understand issues related to the environment unless we can draw upon the insights gained from studies in science and engineering, in economics and politics, in law and public administration, and in ethics and values (to name just a few of the relevant fields)? In this sphere, and various others, we will need to design our programs in a more integrated way, involving participants from departments and Schools across the university. In addition, these programs will require a closer link between research and practice, between classroom study and fieldwork, between academic analysis and the shaping of public policy.

Fourth, the economy may improve in the next few years, but resources are almost certain to remain relatively scarce, and competition for those resources will be intense. This situation presents a serious test for higher education. Our main sources of income—endowment earnings and annual gifts, student tuition and fees, and the sponsorship of research—have been under mounting pressure for some time, and we can therefore expect our financial situation to remain difficult.

As a result, we made a conscious decision early in the planning process to restrain growth, and to recognize directly that no single institution can or should attempt to cover all fields. From the outset, we have concentrated primarily on programs where we already have strong foundations in place, or where an additional but limited investment can provide the extra resources necessary to achieve and sustain initiatives of the highest quality. Consequently, we have turned aside many proposals, not because they lacked merit, but because they were not consistent with our fundamental planning approach.

Concurrently, we have undertaken an intensive review of existing budgets and programs. This involves a progressive effort to control costs, streamline systems, consolidate functions, and make selective reductions when necessary. We must continue to approach this process as a regular activity of the university—a habit of mind—rather than a discrete project to be undertaken, completed, and then put aside. It is being carried forward by working through our ordinary channels of decision making,

including consultations with different groups as appropriate. An emergency "crash program" would be far less likely to produce either wise decisions or a strong willingness on everyone's part to help resolve the financial challenges that we face.

To date, this steady, disciplined approach has fared well—better than is likely to have resulted from a highly centralized plan of predetermined cuts. The annual operating deficit in our largest Faculty, Arts and Sciences, has shrunk steadily from nearly $12 million three years ago to about $3.9 million at the end of 1992-93. And the rest of our Faculties and other academic units have maintained or recently achieved financial equilibrium, or are well positioned to do so very soon.

Nonetheless, much remains to be done. For instance, although considerable progress has been made in reducing the extent of our deferred maintenance, we are not yet investing enough each year to be in true equilibrium on this front. In addition, there are economies still to be achieved—in areas that range from purchasing supplies, to collecting and processing data, to contracting for services from outside suppliers. Meanwhile, the cost of faculty and staff benefits, particularly health benefits, has been rising at an especially rapid rate over the past several years. Each of these issues will require careful study and action, allowing us to proceed in a way that minimizes disruption, maintains the basic soundness of our programs, and yet also protects the university's long-term financial health.

Fifth, budget cuts, economies, and self-restraint in planning can achieve a great deal, but they cannot eliminate the need for selective new investments in some important activities or fields. For example, new technologies, scientific facilities and instrumentation, and library information systems are developing at a fast pace. All of them are expensive, yet we will very soon lag behind if we fail to make the necessary investments. Moreover, while we must explore more efficient methods of teaching, excellent education is and will remain a highly labor-intensive activity: it is a process that is inherently and inescapably human. In the end, there can be no substitute for direct, personal interchange between student and teacher—and therefore no substitute for investing in sufficient faculty to provide opportunities for intensive small-group teaching

and learning. In addition, if we want to keep Harvard accessible to students from across the economic spectrum, we will have to invest significantly in financial aid. Finally, and especially for undergraduates, we must sustain the quality of our residential environment and our extracurricular opportunities so that they remain conducive to the development of "whole" human beings outside the classroom as well as inside.

During a period of constrained resources, our economic circumstances will require us to proceed on a number of fronts simultaneously: we need to economize and make selective program reductions even as we seek increased levels of support to maintain the excellence we have achieved—excellence that will quickly begin to diminish if it is not constantly nurtured and reinforced. "Reality," wrote Emerson, "has a sliding floor." To keep abreast of that reality, Harvard cannot stand still.

4. GUIDING PURPOSES AND PARAMETERS

HAVING DESCRIBED A NUMBER OF THE TRENDS that seem most likely to influence our efforts in the years ahead, let me now outline some of the general purposes that we have defined in the planning process of the past two years. Again, oversimplification is inevitable, but the main points include these:

First, Harvard is committed to remaining a university in the fullest sense of the term: an institution dedicated to the close integration of research, graduate and professional education, and undergraduate learning in the liberal arts. Our goal is to stimulate intellectual exchange among faculty and students in an environment where education and the discovery of new knowledge not only coexist but energize one another.

When information and knowledge are growing and changing so quickly, it is more important than ever for talented students to be able to participate fully in the life of an institution where the greatest challenges of our time—across many disciplines—are being explored in creative and rigorous ways. It is equally important that faculty be able to share the results of their research not only through books and journals, but directly with students in lectures,

seminars, tutorials, and informal discussions. It is precisely this interchange—this integration of research, teaching, and learning in a process that dissolves their "separateness"—that defines the distinctive character of a modern university.

This conception of a university is neither universal nor without its imperfections. Yet it remains an immensely powerful model, one that has produced unparalleled achievements throughout the past century. It needs continual adjustment and renewal. But it has proved to be exceptionally durable, magnetic, productive, and (in today's language) "competitive." For example, the number and quality of student applications to Harvard have never been higher than they are today. And, equally revealing, applications to Harvard from outstanding students from around the world continue to rise. These are reassuring signs, but we cannot take them (or any other positive indicators) for granted. To remain competitive and excellent will require increased effort and intelligent restructuring in the years to come.

Second, Harvard must remain strong and diverse as a human community as well as an academic one. We will continue to reach out, as in the past, to enroll talented students from a wide variety of backgrounds and income groups. Similarly, we intend to make further progress to increase the diversity of Harvard's faculty and staff (a subject addressed at greater length toward the end of this report).

More generally, given the centrifugal tendencies of our time—and the extent to which the fabric of so many institutions, systems, and even entire nations has been strained—it is critical that we find ways to foster unity within our diversity, and to build upon the exceptional sense of institutional identity that has long characterized Harvard. The fact that Harvard is a residential university affords us great advantages. It provides a special opportunity to realize the full educational benefits of diversity, by bringing students and others together in a setting where they come to know one another in dining halls and in lecture halls, in libraries and in laboratories, on playing fields and in public-service pursuits.

Partly because of our concern about the human dimension of Harvard, and partly (as suggested earlier) because of financial realities, we expect the overall scale of Harvard to remain approximately the same in the decade ahead. The undergraduate student

body should not grow. The graduate and professional student body will remain essentially stable, except in a few areas of high priority. No new Schools or other freestanding major academic units are planned.

Some individual programs and activities will expand during the next several years, and some new facilities will be needed. But, viewed in the context of the university as a whole, these increases will be modest. For example, our university-wide faculty is likely to increase by roughly 80 to 90 positions in the next several years (nearly half of them in Arts and Sciences), but this represents a planned addition of only about 4 percent. Our physical plant will grow in select areas (described more fully below). Yet the balance will increasingly be struck in favor of the renovation and adaptive reuse of existing facilities, rather than the construction of new ones. When new construction does occur, the emphasis will lie less on freestanding entities, and more on the creation of space that physically connects related departments or programs, thus promoting opportunities for more cooperative work.

Remaining a strong human community will also depend on maintaining close and fruitful relations with our neighbors—in Cambridge, Boston, and beyond. We are full participants and partners in the life of these communities, and we intend to do our share in helping to sustain the vitality and quality of our common living environment.

Finally, Harvard is committed to remaining an institution of humane learning in the liberal arts and professions, at all levels and in all Schools. Our major activities—not only in Arts and Sciences but also in our professional schools—are strongly devoted to the search for fundamental knowledge: for basic patterns that can help us understand nature or human behavior more fully; for principles of broad application that can help to explain phenomena at much deeper levels than would be required if our only goal were the solution of very specific or purely practical problems. This point may seem obvious. But it is worth a moment of special notice, at a time when the central purposes and directions of many major institutions—universities among them—are often in question.

Humane learning in the liberal arts and professions has a simple yet profound motive force: the constant drive to know and to

understand. Human beings have always been genuinely philosophic. We have always had a deep desire to comprehend the meaning of existence, to fathom our own "nature and destiny" as well as the nature of nature itself. "Curiosity," said Dr. Johnson, "is, in great and generous minds, the first passion and the last." Without this passion, brought to a very high order of disciplined inquiry, no university is likely to survive, much less flourish.

How can a modern university organize this abundance of energy and knowledge? How can it best give such passion an adequate formal structure through the design of its curriculum, academic departments, and programs of research? How should limits be set, and lines drawn, so that the university can be ambitious and far-reaching in its aspirations, yet manageable and coherent as an institution—and realistic about what it can achieve and afford?

These questions are too large and general to be answered in detail in this document. But it is important to reflect for a moment on one central point that they raise: namely, the civic role of our major universities as custodians of so much of the record of human civilization. That role—indeed, responsibility—is to preserve the cumulative knowledge of our past actions, creations, investigations, and speculations: not just to preserve, but to interpret, to reexamine, and to be a living expositor and teacher, as well as a bountiful library and archive.

Universities committed to such purposes have an obligation to keep alive not only knowledge that may be significant and useful today, but also knowledge that has been significant in the past and may prove surprisingly so in the future. No single institution should assume a disproportionate share of this obligation. But to the extent that we care about our own history, and that of the natural world, we must ensure that certain languages and civilizations, certain aspects of science, and certain forms of art and culture continue to be preserved and studied. Otherwise, they will soon disappear, and we will permanently lose parts of the total human pattern that we seek to understand.

From this point of view, there will always be aspects of a university's program that may seem inefficient or "irrelevant." Yet even in these cases, unexpected events can change our perspective almost overnight. For instance, when Harvard founded an institute

for Ukrainian studies many years ago, some people regarded it as an esoteric undertaking—much like the study of Arabic when begun during the nineteenth century. Recent history has made both fields far more topical and relevant—here and abroad—than many people might ever have imagined. And, for the better part of a century, enrollments in Chinese and Japanese studies were so small that one might have questioned an American university's intensive efforts in those fields. But today, institutions that once supported such subjects mainly for their intrinsic intellectual and cultural interest enjoy strong East Asian programs that are heavily subscribed and obviously relevant to contemporary life in the United States and beyond.

One last example: In 1937, a young Harvard faculty member named Howard Aiken began designing a machine to do arithmetic calculations. He was warned to stick to physics: the university already had enough "calculators." Seven years and several bruising battles later, he succeeded in having the new machine installed at Harvard. Built in close collaboration with IBM, it was regarded—throughout its initial stages—as lacking "any commercial application." Thus it happened that the first modern computer was born, and that the first embryonic computer science department came into being.

These examples, though anecdotal, underscore why it is so important for universities to carry out their civic responsibility to preserve, interpret, and indeed help create our intellectual and cultural heritage. All knowledge has potentially many different uses. And knowledge suddenly can leap, so to speak, from obscurity to celebrity—and can develop along paths we would not have dared to predict. In a situation so full of unknowns, we will have to rely on the abilities and insights of the most capable faculty and staff we can find: they are not infallible, but we will not easily discover better guides when we must decide which fields of knowledge to support, which library books to buy, or which scientific instruments to acquire.

There remains the pressing need to set limits—to focus no less on what we can forgo than on what we can pursue. We will find no obvious, all purpose answer to this challenge. Experience, judgment, and a knowledge of the broader terrain being explored and

covered by other universities and other institutions can help us arrive at a sensible balance. The critical point, however, is this: when we think about support for our leading universities, we need to bear in mind the significant costs that these institutions carry on behalf of our society and culture. It is not at all clear where we would turn to find anything resembling a comprehensive record of knowledge and human civilization—a living record, animated by scholars and students—if we could not turn to the world of humane learning at our leading universities.

Part II. The Arts and Sciences

In light of the broad outlines above, we can now discuss some of the more specific priorities and needs identified in the university-wide academic planning process. (Since the plans together fill more than 2,000 pages, omission will far outweigh inclusion, and much of this discussion will have to focus on cross-cutting themes and initiatives that touch on a number of different departments or Schools, without doing full justice to many important initiatives that are primarily local in character.) I want to stress at the outset that our plans are just that: *plans*, which reflect the current state of thinking about directions and approaches for the years ahead, but which will be subject to continual refinement and reappraisal as time passes and circumstances evolve.

Let us begin with some of the major directions in Arts and Sciences. Among our chief priorities are these:

- To strengthen our already excellent program of undergraduate education, with special emphasis on teaching and aspects of residential life;
- To expand our work in select important fields, including the biological and applied sciences as well as others;
- To redesign some of our major facilities in the humanities, the social sciences, and the natural as well as applied sciences in ways that will help integrate related fields of knowledge and build a greater sense of community among faculty and students;
- To continue the process of making our doctoral programs more effective, while providing adequate financial support to enable students to complete their studies in a timely way.

Other matters of central importance to Arts and Sciences—involving the library, information technology, international studies,

financial aid, and faculty diversity, among others—will be discussed in later sections of this report.

I. COLLEGE LIFE AND LEARNING

By some measures, liberal arts education in the United States has suffered a steady decline in recent decades. There are significantly fewer liberal arts colleges in both absolute and relative terms, and many of our remaining liberal arts colleges are devoting a greater portion of their curricula and resources to preprofessional studies. Although the number of high school graduates who pursue some form of higher education has continued to rise, liberal arts education in the United States is much scarcer than most people might think. This is a matter of increasingly urgent concern.

Perhaps more than ever, society has a vital need for college graduates—future leaders—who understand different ways of thinking and different forms of knowledge, and who have the capacity to integrate and use what they know. There is also a need for educated individuals who have had the experience of living and learning with a talented and diverse group of peers from across the country and around the world—in a setting that both invites and requires them to develop and express their individuality, to exercise responsibility, and to acquire a deeper appreciation for the concerns and perspectives of people they might not otherwise encounter. There is certainly no guarantee that a residential liberal arts college will succeed in meeting all of these goals. But the record of the past is a strong one, and it is worth all our effort to create an even stronger record in the future.

The recommendations of Dean Jeremy Knowles and his colleagues, as well as of our planning group, focus on three main aspects of the College: the undergraduate curriculum, residential life, and the teaching mission.

The Curriculum

For many decades, Harvard's undergraduate curriculum has had essentially three guiding principles.

The first is a commitment to a program of general education, requiring students to explore a number of important fields of knowledge and ways of thinking. This purpose is currently served by the Core Curriculum, introduced in the early 1980s.

The second principle is the belief that focused study within a particular field of concentration can motivate students to excel by following their strongest interests and talents to the highest level they can achieve. Tutorials, independent research, and senior theses are an integral part of this program, as is the opportunity to take graduate-level courses.

Finally, there is the conviction that students should have a degree of curricular flexibility and choice, above and beyond the choices available within the field of concentration and the program of general education. President Eliot—who originated the elective system more than a century ago—believed unequivocally that outstanding and highly motivated students would do best if given the opportunity to pursue their own interests across a wide range of disciplines. Eliot's insight is no less sound today, and it finds expression in that portion of the undergraduate program (roughly one-quarter) that allows students to explore any of the subjects taught by departments or other academic units in the College.

Harvard's undergraduate curriculum fulfills its primary purposes with unusual success. It stimulates and challenges the extraordinary group of students who attend the College. It makes clear that excellence and high achievement are the university's implicit as well as explicit goals. It offers students the excitement and ambience of a large, robust, and very great university together with the structure and strong identity of an undergraduate college that lies very much at the heart of the institution as a whole.

For instance, since its adoption roughly a decade ago, the Core Curriculum has stressed the need for students not only to acquire knowledge of important subject matter in several major fields, but to become familiar with different ways of thinking and different methodologies. Both activities are essential elements of a single complex process of learning and discovery, and the Core is designed to involve students in that process as a whole.

The six designated major areas of the Core are historical study, foreign cultures, social analysis, science, literature and arts,

and moral reasoning. (In addition, every student must reach a certain level of proficiency in a foreign language, satisfy a quantitative reasoning requirement, and take a first-year course in expository writing.) The range of offerings is rich, and most Core courses are taught (contrary, perhaps, to expectation) by distinguished senior faculty. A sampling of current and recent offerings includes: "Conceptions of Human Nature" (Prof. Brendan Maher); "Modern Democracy" (Prof. Samuel Huntington); "From DNA to Brain" (Profs. Howard Berg and John Dowling); "Ethnicity in Modern American Literature and Culture" (Prof. Werner Sollors); "Fairy Tales and the Culture of Childhood" (Prof. Maria Tatar); "History of Life" (Prof. Stephen J. Gould); "The Public and the Private in Politics, Morality, and Law" (Prof. Seyla Benhabib); "The Concept of Hero in Greek Civilization" (Prof. Gregory Nagy); and "Hindu Myth, Image, and Pilgrimage" (Prof. Diana Eck).

With the Core in place, the next major effort at curricular review concerns the undergraduate concentration. Shortly after he was appointed in 1991, Dean Jeremy Knowles established a new faculty standing committee on educational policy (the EPC). The charge of the EPC is to work closely with academic departments and instructional committees in order to evaluate, among other matters, the structure and purpose of the various undergraduate concentrations. This review—already well under way—is focused on several carefully chosen questions:

- How should each department or committee ensure that its concentration requirements build on a coherent sequence of courses or tutorials that shape the conceptual "spine" of the concentration? How should the rationale for this sequence—and for other elements of the concentration—be communicated to students in a clear and accessible way?

- How should the departments and committees ensure that concentrators have adequate opportunities for participatory small-group instruction (through tutorials, discussion sections, and otherwise)? What are the respective roles of graduate students, junior faculty, and senior faculty in providing such instruction?

- What is the proper "capstone" experience for undergraduate concentrators? Should all concentrations culminate in some form of independent work with a written component? Should there be a general examination for all concentrators within a given field?
- How can the system of academic advising be improved to help students navigate their way through concentration requirements?

The EPC has recently presented its preliminary thoughts on these and related questions to the full Faculty of Arts and Sciences, and broad-ranging discussion is expected in the months ahead. For now, this initiative has already emerged as the most significant effort in many years to evaluate our undergraduate concentrations in a concerted and comprehensive way.

Residential Life

Narrowly conceived, the simple fact of residence—of room and board on campus—means little. But the structure, tone, and values implicit in a campus residential community can have a profound bearing on the undergraduate experience. At Harvard, a great deal depends on the system of Houses, and on the leadership and commitment of the House masters, tutors, faculty associates, and staff. They (and others) have a special responsibility to encourage students to meet and come to know one another well, to offer guidance and support when needed, and to help establish standards and ground rules that promote the College's academic goals as well as its vitality as a dynamic and diverse human community. Given the importance of residential life to a student's undergraduate experience, the emerging plans for the College have much to do with the structure and ambience of residential life, and on facilities designed to stimulate interchange among students and between students and faculty. Highlights of these plans include the following:

- *To complete the renovation and proper restoration of the dormitories for all first-year students.* This project is well under way, and planned to conclude by 1995. Already the results are impressive.

For instance, Weld Hall—renovated in 1992—is handsome, cheerful, full of light, and even conducive to study. Much the same can be said of the several buildings—Greenough, Hurlbut, Lionel, Matthews, and Mower—that were fully refurbished in time to welcome the class entering in Fall 1993.

- *To transform Memorial Hall into a student commons and dining hall, mainly for first-year students but open to all.* The main "great hall"—decades ago the dining area for all undergraduates—will now become the dining area for all freshmen. The ample space on the level below will take shape as a student commons, with rooms for meetings as well as recreation and social gatherings. In effect, Memorial Hall will become a kind of "House" for first-year students, providing a real focus for freshman residential life, only steps from the Yard. Thanks to two very generous recent gifts, work on the project is due to begin in the near future.

- *To help the Houses achieve a greater integration of residential and academic life.* We intend to increase the number of House-based seminars offered by faculty and visitors: courses that bring more faculty into the Houses, and encourage more small-group discussion not only in class but informally, at meals or over coffee. On another front, we will continue work on a computer network that will electronically link all student rooms to one another, to various university offices, and to databases and larger networks containing information on course offerings, library holdings, events calendars, and much more (not only at Harvard but at universities and other institutions around the world). Part of this network is already in place; as it becomes fully operational, it will have increasingly important implications for how teaching and learning take place.

- *To improve extracurricular programs and related facilities in several areas—including the arts, athletics, and student public service.* Main points of the detailed plans include the following:

  - In the arts, there will be—among other projects—a much-needed renovation of Sanders Theatre (carefully preserving its original fabric and appearance); a major renovation of Lowell Lecture Hall, to provide practice, rehearsal, and per-

formance space for student musicians; and a possible new Center for the Arts, to help coordinate and support the activities of different arts organizations on campus.

- In athletics, the outdoor track needs rehabilitation in the near future; a new facility for racquet sports is overdue; a number of women's intercollegiate programs are being strengthened; some senior coaching positions remain unendowed; and several sports need additional core support for their basic programs.

- In public service, the tradition of student involvement—through Phillips Brooks House and in other settings—continues to flourish. Roughly two-thirds of our College students participate in some form of public service during their four years at Harvard, including programs in local schools, in health services, and in homes for the elderly, to mention only a few. As such programs continue to expand, we will need to plan for increased training of volunteers, basic program support, and more effective coordination.

Far more deserves to be said about residential life at Harvard College; but this brief summary offers at least an introduction to how we hope to build on the strong foundations already in place.

Teaching and Learning

Every college and university must experiment with a variety of formats for teaching and learning. No single one is ideal for all situations, all disciplines, or all students. Finding the right mix—one that produces excellent pedagogy and also remains cost-effective—is a critical task, amenable to any number of different approaches. At the same time, any serious educational program must recognize the importance of offering adequate opportunities for small-group teaching and learning, for formal and informal discussion groups, for seminars and other classes conducive to real interchange between faculty and students.

We believe Harvard can benefit from providing more such opportunities in the future. Our student-faculty ratio in Arts and Sciences is higher than that of most of our peer institutions, and

the situation has become especially acute in academic departments with a large number of undergraduate concentrators. (Seven of our 41 departments and instructional committees attract more than half of all concentrators; ten of them, more than two-thirds.) This problem has led to a rising concern about opportunities for small-group learning.

To some extent, this concern has been and will continue to be addressed by transferring resources from one area to another. But this approach has clear limits, because many of our departments are relatively small compared to those of comparable institutions, and are barely at critical-mass level. For example, several departments with modest numbers of undergraduate concentrators (philosophy, music, and various foreign languages and literatures, to name a few) also have very modest numbers of faculty. Yet they are fields of major intellectual importance, and must be maintained at a reasonable size to ensure their quality and sheer sustainability—especially since they also tend to have a full share of graduate students, as well as healthy course enrollments reflecting demand by nonconcentrators. In other words, faculty in such fields have substantial teaching to do, in addition to their scholarship: undergraduate concentrators are one very important variable in their total program, but only one among several that bear on decisions whether or not to transfer faculty resources from any one such department to others.

Given these considerations—and the basic fact that the overall Arts and Sciences student-faculty ratio is relatively high—the most effective long-run approach is to invest in a number of new faculty positions. These will have to be assigned with great care, and with close attention to where additional faculty can most contribute to improving the undergraduate educational program. The Faculty of Arts and Sciences plan calls for the addition of roughly seven or eight faculty positions per year over the next five or so years (for a total of about 40). Roughly half of these would be targeted for departments where the student-faculty ratio is particularly problematic; others would be reserved for certain fields of growing importance to the more general mission of Arts and Sciences. An increase of this magnitude would represent roughly a 4 percent growth in the Arts and Sciences faculty ranks, and only about 2

percent university-wide. Even if we are fully successful in reaching this goal, our student-faculty ratio in Arts and Sciences would still not equal that of several of our peer institutions. But the educational gains stand to be significant, especially since many of the new positions would be added with the following principal aims in mind:

- *More opportunities for small-group instruction in the most heavily subscribed departments* (eight of which have more than 250 concentrators each, and two of which have more than 500). Our surveys suggest that, aside from tutorials, concentrators in large departments do not have as many opportunities as they should to take small courses taught by faculty members (as opposed to teaching fellows).

- *More freshman seminars.* These have proved to be highly effective and lively forums for teaching and learning. Additional House-based seminars—as mentioned earlier—are also planned.

- *More support for undergraduate research.* Many of our students do their most exciting work in tutorials or independent research courses, particularly when writing senior honors theses. But even basic research equipment and supplies are not always readily available to students in certain fields. And, as more students undertake fieldwork, some funds for travel and associated expenses can make all the difference to the success of their projects.

Our own analyses have shown that even a modest addition in the number of small-group classes or courses can have a major positive effect on the educational experience of our undergraduates. We now have the chance to address this situation at Harvard, and the opportunity is too important to be missed.

Learning To Teach

Adding faculty is one way to help strengthen teaching at Harvard; helping our teachers improve their teaching is another. This is especially important in regard to the many graduate students who contribute to undergraduate teaching at Harvard:

among these teaching fellows are many of the university's most talented and committed instructors. Too often, we may forget that this year's graduate student will be next year's assistant professor.

Especially during the 1980s, the university took steps to provide teaching fellows—as well as faculty members—with opportunities to develop their teaching abilities in a more systematic way. Most notably, the Derek Bok Center for Teaching and Learning (formerly the Danforth Center) is quickly establishing itself as a national model. The Bok Center has introduced excellent orientation programs for new teaching fellows and faculty, as well as more topical programs in areas such as math and science. Individual teachers can have their classes videotaped and closely critiqued. The demand for these and other services is steadily increasing, exactly as President Bok and others had hoped that it would. We now must find extra support to meet the demand for the unusually effective programs the Center offers.

No listing of individual plans or proposals can adequately convey what the university hopes to achieve through a major new investment in undergraduate education. Ultimately, the intellectual atmosphere and the human texture of the campus community form the heart of the matter. In spite of the specific needs outlined above, the general response of most Harvard College students to their undergraduate years remains overwhelmingly positive. As we look ahead, we have the chance to make significant improvements in exactly those parts of our program from which undergraduates have the most to gain.

2. THE MAJOR FIELDS OF KNOWLEDGE

Introduction

DURING MOST OF THE CENTURY after the founding of the modern American university in the late 1800s, the main way to advance research and organize teaching was to form separate units—departments—so that faculty and students could concentrate their full energies on a defined set of topics and methods.

Many new departments came into existence around the turn of the century; many others, in the quarter-century following World War II.

This method of expansion was logical and productive. It has paid enormous dividends in terms of the yield to society, the speed and intensity of new discoveries, and the effectiveness with which educational programs and research projects have been organized. But the method, by its nature, has also tended to separate individuals and disciplines from one another, often producing a sense of increased intellectual fragmentation.

The specter of a multiversity, composed of a larger and larger number of highly specialized departments, is certainly not a new one. Nearly three-quarters of a century ago, Santayana expressed concern that the American university was becoming "an encyclopaedic institute, or group of institutes," in which every faculty member would be

> an expert in some science, delivering lectures for public instruction, while perhaps privately carrying on investigations with the aid of a few disciples whom he would be training in his specialty. There would be no reason why either the professors or the auditors in such an institution should live together or should have much in common. . . . On the contrary, if only each was competent in his way, the more miscellaneous their types, the more perfect would these render their *universitas*.
>
> — George Santayana
> *Character and Opinion in the United States* (1920)

The risks Santayana saw—the potential loss of intellectual community in the university as a whole, the loss of a place where people "live together" and "have much in common"—are perfectly real, although far from inevitable. They need to be guarded against—and can be. At the same time, human beings will always be driven to deepen their knowledge and understanding of particular subjects, and therefore to specialize. The challenge for any university is to find individuals (and to create a variety of structures) capable of fostering different kinds of exploration: we need faculty and students who focus intensively on important but highly targeted problems, and others who scan several fields and widen our angle of vision, helping to achieve more comprehensive forms of understanding.

At the present moment, many scholars are convinced that, in order to progress in even quite specialized fields, they must learn much more about—and borrow from—fields other than their own. For many, the actual process of discovery is forcing a greater integration of knowledge, rather than increasing subdivision and separateness. Of course, this tendency is not universal, nor is the process itself new. But it has now become general enough to constitute a genuine shift in outlook. More departments and other academic units are looking for ways to strengthen ties with their neighbors. Some are considering mergers or joint programs—and two major mergers have already taken place at Harvard during the last year. It is interesting, for example, that the plan for the Faculty of Arts and Sciences does not propose the creation of any new departments—something that would have been nearly impossible to imagine in 1955 or 1965.

This is not to say that Harvard or other universities will never again create new departments. It is only to highlight the temper of our own era. A recent Faculty of Arts and Sciences report, in discussing developments in the sciences, has described this situation well:

> The themes of science are changing. Increasing numbers of scientists are turning their attention to the study of how systems—be they of natural or of human design and construction—are organized, and how their behavior can be explained, controlled, and modified. Many of these investigations of natural and human-made systems require the collaboration of scholars from several disciplines, and many are motivated by societal needs. Many are closely tied not only to the applied sciences and engineering, but also to the social sciences and the humanities.
>
> The growing concern for applied, multidisciplinary questions has implications for research and education throughout the University. In the past, experts from one discipline could often ignore other fields. But in the future, the absence of expertise in one discipline will impede collaboration on a wide range of research and educational issues.

These remarks about science could apply, with adaptation, to other fields as well. Historians, for example, inevitably specialize in particular subjects or periods or kinds of history, and sometimes analyze very small segments of history in enormous detail. But it would be a rare historian today who believes that we can properly study a major episode from the past without learning a great deal

about the economics and politics of the time, the major social institutions and their organization, the religious and other ideological currents of the period, the major developments in technology and science, the different attitudes and beliefs of ordinary people, and the character or psychology of key individuals and groups—as well as much more. If this is the case, is the scholar doing history—or economics, or political science, or the history of ideas, or biography, or all of the above?

This elementary example is far from atypical. And while many historians from ancient times through to Gibbon, Burckhardt, and others have had an extraordinarily broad vision of their subject, it is now harder for *any* serious historian to leave aside an entire set of considerations because they do not seem to concern "history," but rather economics or psychology or another field of learning. Lines of demarcation have blurred, and fields have tended to coalesce. Boundaries are crossed and crisscrossed with increasing regularity.

Three Initiatives

With this introduction as background, we can now consider a few of the main initiatives planned for Arts and Sciences (apart from undergraduate education, and additional areas discussed later in this report). I will focus on only one major initiative in each of the three major areas of knowledge (humanities, social sciences, and natural as well as applied sciences), and then add a brief word about our doctoral programs.

Together, the initiatives in the three major areas of Arts and Sciences represent the single largest academic investment—in terms of faculty and space—among all the plans of all the Faculties and Schools. Even so, the focus is less on expansion than on integration—on creating patterns and structures that will lead to greater coordination among units and greater coherence in planning and program development.

One major problem that each of these projects will address is that of faculty dispersion. In all too many instances, faculty members and teaching fellows in the same or related departments are now located in different buildings. Many teaching fellows do not

have offices—even small ones—or other suitable work space. Under these conditions, many members of the same department rarely see one another, except at formal meetings. They have no departmental home where they meet frequently and naturally for informal discussions or gatherings that can help foster a sense of intellectual community—among undergraduate concentrators as well as among graduate students and faculty.

A major goal of the planned projects, therefore, is to help strengthen that sense of community, partly by adapting existing space (and using it more efficiently) and partly by building some new space that is carefully designed and strategically placed. In addition, a few fields (especially the applied and biological sciences) will be buttressed by adding faculty who work in areas that form natural links between existing departments or groups.

The three proposed projects are the following:

The Humanities. Within Arts and Sciences, the humanities faculty is the most widely dispersed of all. There are too few offices, and these are located in approximately 18 different buildings. Forty of the offices (roughly 15 percent) are in rental space off campus.

The proposed new plan will create a Center for the Humanities, principally housed in the existing Freshman Union. Once the Memorial Hall project is finished, the Union will be converted into the Center's main space. This will allow an underutilized building, in a prime part of the campus bordering on the Yard, to become an efficient and heavily used facility. The Center will bring together faculty from more than a dozen humanities departments, in the Union and adjacent buildings. It should increase the number of offices for humanities faculty by 20 percent or more. It will provide additional classroom space, as well as meeting rooms for teaching fellows and their students. And it will lead to reduced operating costs, as rental space is vacated and administrative services are consolidated. From every point of view, the project will be a major step forward: a significant reaffirmation of what the humanities can represent as a more cohesive enterprise—a broad community of faculty and students from many disciplines, in an environment intended to encourage collegiality and collaboration.

The Social Sciences. Although space problems in the social sciences are generally not so severe as in the humanities, one set of interrelated large departments and programs clearly needs assistance: the government and economics departments, and our combined regional and international centers. The problems here resemble those in the humanities: dispersion of faculty, dysfunctional arrangements, and overcrowding.

The international and regional centers (based in Coolidge Hall on Cambridge Street) have little in the way of classroom space or common facilities for lectures, colloquia, and other events that would promote more joint activities among the different units. Even core office space for some regional centers is notably scarce, at a time when more faculty are taking a greater interest in international studies. Meanwhile, the government and economics departments (based in Littauer) have for some time been overcrowded. These fields are two of Harvard's most popular undergraduate concentrations, yet they too lack proper office and teaching space; they have inadequate facilities for teaching fellows; and there is almost no space for joint research projects. The situation is serious and demands attention.

At the moment, different options are being studied, with a final recommendation expected soon. The objectives are similar to those in the humanities. First, we must create a new configuration that will not only provide improved space, but link the intellectual disciplines and the teaching and research activities particularly in government and international affairs. Second, we need a more hospitable environment for the international and regional centers, so that they—and Harvard as a whole—can capitalize on their combined strength (and also enable them to realize administrative economies). In its totality, this is a very important project. If Harvard is to sustain and strengthen its work in international and area studies, we must prepare now for the continued expansion of interest and activity already evident on all sides.

The Natural Sciences. Two new facilities are planned, primarily to accommodate growth in the biological sciences and the applied sciences. Here, too, the facilities are designed to create linkages between existing departments and groups, rather than to house new freestanding units.

The biological sciences have undergone a profound transformation in the past several decades, and Harvard intends to remain at the forefront of advances in these rapidly evolving fields. The building proposed for the life sciences would reinforce the physical connection that already exists between Mallinckrodt (which houses the chemistry department) and Fairchild (biochemistry and molecular biology); it would also improve links between biology and related fields. The new space would provide labs and offices for up to thirteen faculty, as well as some classrooms and shared facilities. New appointments will be targeted for "bridge" fields—such as molecular design, cell differentiation and development, or neuroscience. In this way, the intellectual plan for the future of these interrelated fields will match the more flexible space design. Both would alter previous patterns of building separate additions to separately housed departments—an expensive approach, and one that retards the kind of cross-departmental work now needed.

In the physical sciences, the chief need lies within the Division of Applied Sciences. Growing numbers of very talented students are enrolling in the division's programs, consistent with society's increasing need for advanced learning about computing and information technology, manufacturing and materials technology, energy and the environment, and other related fields. But the number of faculty within the division is simply too small, especially in key areas such as computer science and electrical engineering. Given the clear centrality of work in these disciplines, and its relevance to so many other departments at Harvard, Arts and Sciences intends to add eight faculty in the two key areas identified, as well as six more in other fields within the division (such as materials science and oceanic and atmospheric science). These faculty will become members of a division that is already highly interdisciplinary and interactive. The planned new building—linked both to Cruft (above ground) and McKay (below)—will include laboratories and other facilities for the applied sciences as well as for physics.

A Word on Doctoral Programs

The Ph.D. program in Arts and Sciences has recently been under review. Several departments in the humanities and social

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sciences are engaged in an experiment that has several purposes. The basic goal is to ensure that doctoral students have a good balance of general and specialized courses, and—even more important—that they have proper guidance as they undertake substantial research projects and then begin work on their dissertations. Small-group dissertation seminars—where students present their dissertation ideas to faculty and fellow students—are helping build forums for constructive discussion. They are also introducing clearer milestones on a road or journey that is often solitary—and whose end is not always in sight. In addition, special grants are being made to students who need assistance at the beginning of their dissertation work, or at the very end, when time for uninterrupted writing is at a premium.

Another important step has recently been taken by the Faculty of Arts and Sciences in cooperation with all the other Schools in the university. In the spring of 1993, a proposal was approved to establish a new university-wide committee to help provide oversight of doctoral programs throughout Harvard. As a result, much better coordination of joint programs, more attention to the advising system for Ph.D. students, and more opportunities for cooperation among different Schools and Faculties will now be possible.

3. A CONCLUDING NOTE

THIS DISCUSSION HAS COVERED only some of the goals that we hope to achieve in Arts and Sciences, and only in a summary way. But it at least describes our broad objectives, including some themes of special significance. There is much more that could be said, not only about the academic departments in the Faculty of Arts and Sciences, but also about the important allied and affiliated units both within and beyond Arts and Sciences: the American Repertory Theatre, the Arnold Arboretum, the Division of Continuing Education, the W.E.B. Du Bois Institute for Afro-American Research, Dumbarton Oaks, the Harvard Forest, the Center for Hellenic Studies, the Harvard Institute for International Development, the Center for Literary and Cultural Studies, the Nieman Foundation, the Villa I Tatti, the Harvard-Yenching

Institute, and numerous others. Harvard's museums—naming some would only risk slighting others—deserve a chapter of their own. They have—among universities—unsurpassed collections, and some are now at a point where they have very important needs to be addressed, especially if their collections are to be used more effectively in undergraduate teaching as well as in advanced training.

For the moment, we can take encouragement from the fact that Arts and Sciences at Harvard remains exceptionally strong. The scope of what we believe should be achieved in the next decade is ambitious, but it is also manageable in relation to the enterprise as a whole. We are in a good position to make real strides, as long as we concentrate our energies and keep our most important objectives clearly in mind.

Part III. The Professional Schools

I. THE CHANGING PROFESSIONS

NEARLY ALL THE MAJOR PROFESSIONS in the United States—and the organizations associated with them—are in a state of unusual flux. Businesses face a difficult and uncertain economy, an altered international situation, and an era of widespread fundamental restructuring. The health-care system is under severe strain and is undergoing efforts at large-scale comprehensive reform. Much the same can be said of our troubled public schools. Many institutions of government—throughout the world—are perceived even by those within them as being in need of serious rehabilitation; and global political developments have made the study and practice of public affairs even more complex than before.

Meanwhile, the legal profession faces a far more complicated international as well as national agenda: increased litigation and regulation, persistent questions concerning human and civil rights, the effort to help frame constitutions and systems of justice in emerging democratic societies, and a domestic criminal justice system under great stress. The religious landscape has been dramatically transformed during the past quarter-century, in our own country and beyond. Some established faiths have waned, while new sects and congregations have burgeoned; various fundamentalist movements have emerged with great force; and questions about the relationship between religion and politics or government have arisen—in many quarters of the globe—with great intensity. Finally, in architecture and its associated design fields, there have also been profound changes—partly because of the continued internationalization of these professions, partly because of changes in the economy, and partly because of the need to address important social problems, such as preserving our built as well as our natural environment.

These developments in the professions—and in the major systems and institutions that are part of professional life—have an inevitable, far-reaching impact on education. If the professions change in more than superficial or transitory ways, then education for the professions must also change. A fundamental reexamination of many of our basic programs is already well under way at Harvard. Given the variety of Harvard's professional schools—business, design, divinity, education, government, law, medicine and dentistry, and public health—we obviously cannot expect to find a single new educational model or conception that will apply equally well to all or even most of them. Yet a number of common approaches and similar emphases have emerged in the course of our planning process. These, as well as a number of more specific initiatives, are described below.

2. RECONSIDERING PROFESSIONAL EDUCATION

Among the most prominent common themes and directions emerging from the plans of our professional schools are these:

First, nearly every School is reviewing, or has recently finished reviewing, the design of its first-degree program—and, in some cases, its more advanced training programs as well. The Medical School has led the way: it began to phase in its watershed New Pathway program for the M.D. degree in the mid-1980s, and full implementation is near. The School of Public Health has just reorganized its basic curriculum around five interdisciplinary topics closely linked to its main research agenda; meanwhile, a special fund has been created in the School to support experiments with promising new teaching methods. The Business School is in the midst of a full-scale review of its M.B.A. program, and specific recommendations are expected soon. The Graduate School of Design is reexamining the curriculum for its master's programs, aiming to provide all students with the opportunity for an integrated introduction to the major design fields, including architecture, landscape architecture, urban design, and planning.

These are only a few leading examples of the "reconstruction" now under way in Harvard's professional schools. Comparisons

are difficult, but it is hard to remember a time in recent history when curricular reform in professional education at Harvard has been so pervasive, so fundamental, and so potentially significant in its consequences.

Second, the Schools' plans reflect a growing emphasis on the mission of training for leadership in public service. The professional schools have always been motivated to educate students to become leaders who will—in the fullest sense—be useful to society. At present, however, there is an even stronger emphasis on the importance of leadership and on the mission of public service—an emphasis that is not ideological so much as genuinely civic in nature.

There is, as I suggested earlier, a greater concern to help restore the vitality of large-scale systems and organizations that have been weakened in the past quarter-century. There is a special concern for the not-for-profit sector of society: schools, government, social service organizations, and cultural institutions and activities. And there is a marked tendency to take into account more profoundly the difficult questions of ethics and values that are intrinsic to all professional practice today.

In other words, many of our professional schools are defining not a new mission, but a different emphasis in the way they are approaching their traditional mission. There is a more conscious awareness that the world is troubled, that the foundations of society seem less stable, that interdependencies are greater, and that our need to be responsive must also be greater. Such concerns—underscoring a determined yet unromantic commitment to serve society—echo through the planning documents of many Schools.

Third, virtually every School has identified the reexamination of teaching methods as a major point of focus in the years to come. For it is teaching, in many different settings, that must bring together fundamental or abstract knowledge, the fruits of current research, and something of the experience of "live" practice and decision making.

Equally important, teaching needs to be structured in a way that involves students as active participants in the process of inquiry. From this point of view, the best teaching should be seen as an embryonic form of research. It should be designed to confront

students with the need to test ideas and hypotheses against facts and experience, to find new ways to approach difficult problems, and to search for and analyze relevant evidence. It should, in other words, help students to develop habits of mind that can sustain them throughout a lifetime of facing unpredictable challenges and dilemmas that require continuous learning.

Seen from this vantage point, teaching methods, curricular substance, and research activities are deeply dependent on one another. So it is not at all surprising that Harvard's professional schools have identified the development of more effective teaching methods and materials as integral to the redesign of their programs.

Finally, the professional schools, with few exceptions, do not plan large-scale expansion in the decade ahead. This point, mentioned earlier, needs only brief elaboration here. The number of students enrolled in the Schools will, for the most part, remain about the same. There will be some increases, especially though not only in the Division of Medical Sciences doctoral program and in the School of Public Health. Most of the Schools, however, already have relatively high student-faculty ratios, and some are even planning to trim the number of students in certain areas.

With respect to faculty, there is a proposed net increase of about 40 to 50 positions across all the nine professional schools over the next several years (in addition to the 40 new positions in Arts and Sciences). This modest expansion is designed partly to strengthen the teaching mission, and partly to promote promising research efforts.

New construction in the professional schools will be limited. The new Law School building at Holmes Field is now nearly complete. The School of Public Health—which has not added new space for two decades, despite considerable programmatic growth—will add roughly 100,000 net square feet to relieve overcrowding. Other planned changes, however, will make use of already existing space. Laboratories at the Medical School, for instance, will be renovated as major new faculty appointments are made. Some classroom, library, or other modifications are planned at the Divinity School, the Design School, the Law School, the School of Dental Medicine, and elsewhere. The largest prospective

renovation project involves the pending acquisition of Boston English High School, adjacent to the Medical School and hospital complex in the Longwood Avenue area. It represents an ideal setting for collaborative projects involving the Medical School, the hospitals, and possibly other groups—efforts that could significantly strengthen the biomedical research base not only at Harvard but throughout the greater Boston area.

3. SELECT INITIATIVES OF THE SCHOOLS

ALTHOUGH THE PROFESSIONAL SCHOOLS do not plan major growth in the next decade, they will clearly not remain in a holding pattern. Quite the contrary. The redesign of many existing degree programs, the emphasis on new approaches to teaching, the creation of several inter-School initiatives, the focused reinvigoration of research efforts in select fields, the intensive use of new technologies, the review of advanced education for mid-career professionals as well as for recent college graduates—these and other activities will more than sustain the pace of change in the years to come. The intention to be "smarter" not "bigger" will test our institutional imagination and resilience, as well as our ability to live within well-defined limits.

Of course, many of the most important and innovative of the planned initiatives are specific to the individual Schools. Given the significance of these initiatives, and the difficulty of conveying their substance in a general discussion of professional education across many different fields, I have tried to summarize briefly some of the main points of the individual Schools' plans in the several pages that follow.

The Graduate School of Business Administration

The Business School remains committed to the education of general managers—across the whole spectrum of business activity—and to understanding the actual practice of management. It is now in the midst of a full-scale review of its M.B.A. program. Known as "Leadership and Learning," this reexamination is an opportunity to consider and reshape business education in the light

of changes in the global economy, information technology, the nature and composition of the contemporary workforce, and the characteristics demanded for successful leadership. The process may result in a significant reconfiguration of various aspects of the M.B.A. program—from the number and content of required courses, to the size and structure of first-year "sections," to the role of student fieldwork or apprenticeship opportunities, to curricular flexibility that would allow students who have specific interests to pursue them more intensively. The effort will stress the School's growing emphasis on values, leadership, and business responsibility, as well as the growing importance of international perspectives.

The School is also rethinking the range and content of its executive education programs, to keep them responsive to the lifelong learning needs of business managers, their companies, and the broader community. Central to this effort is the attempt to maintain the right balance between on-campus and off-campus learning, and to make appropriate use of different teaching formats—such as video, teleconferencing, computer programs, and traditional case studies. In support of such initiatives, the School's publishing organization is developing new means of delivering the School's intellectual capital to managers, students, and scholars around the world.

The School's research activities remain very closely linked with its teaching programs. Rigorous, relevant field research continues to demand a large-scale commitment of time and resources, so that faculty can work directly with practitioners and understand firsthand the problems that managers confront. Meanwhile, the investment in new technologies and the development of international case studies will be not only sustained but expanded. This is a continuing effort, but one that will in the future require an even greater investment of faculty time and financial resources. Finally, the School is now developing a greater capacity—with more faculty involvement—in the extremely important area of not-for-profit management.

The Graduate School of Design

The Design School seeks to prepare professionals concerned with the making of built environments, and to advance knowledge

and skills in architecture, landscape architecture, and urban design and planning. Particularly at this point in history, the School is committed to maintaining an open approach to design problems, without attempting to impose any single style or tradition in its education and research. In both teaching and scholarship, the School is concerned about issues such as the need to respond to the larger design and planning problems of many metropolitan areas, both here and abroad. Questions concerning the relationship between urban settlement patterns and the social and economic condition of communities within our cities are a critical part of the larger "metropolitan agenda." In addition, there is the continuing need to preserve the cultural legacy of older buildings and landscapes, while maintaining appropriate opportunities to address present-day needs.

As already suggested, the School of Design is undertaking a comprehensive review of its degree programs. One major goal is to strive for more cooperative teaching and research among the School's main departments and programs. This will involve, for example, design studio offerings for master's degree students, allowing a focus on problems that demand an understanding of the methods and perspectives of all the major design fields. In addition, the School will devote a greater share of attention and resources to its midcareer advanced-degree programs, in response to the needs of the profession.

Finally, there will be an effort to strengthen the already strong programs concerning the relationship between the built environment and the natural environment, as well as to expand the School's involvement in regional and urban planning—including a newly established joint Program in Urban Planning with the Kennedy School of Government. Throughout, the School will continue to stress the ways in which creative uses of advanced information technology can be integrated fully into the curriculum, research, and design practice.

The Divinity School

The Divinity School prepares students who wish to enter the ministries of various denominations, and also offers advanced study in religion and related subjects to other students who wish to enter

careers in teaching and human service. There is an emphasis on research through historical and comparative approaches to different religious traditions, as well as a strong concern to foster public discussion about contemporary ethical, social, and political issues.

The School hopes to create a far more informed dialogue on how values and ethics rooted in various religious traditions relate to values that are central to political institutions, to the world of business, and to the practice of law, medicine, and other professional fields. To realize this goal, a new Center for the Study of Values in Public Life will be created. The Center will address, for instance, problems concerning the role of religion in American public life and in international affairs. At a time when religious values influence the attitudes of many citizens on a range of domestic issues, and when religion continues to play a critical role in relations among different nations and peoples, the need for careful examination of religion's public role is apparent. To study such issues critically—and to help professionals in a variety of fields explore practicable solutions to problems of this kind—will be one of the Center's chief purposes. The Center will also be important to the School's effort to encourage more interdisciplinary work, and to bridge the gap between the more practical or technical aspects of professional training and the classical text-based methods that are characteristic of traditional theological education. The recent appointment of a distinguished senior scholar in religion and society has helped to launch the Center's work, and two additional faculty appointments are contemplated.

On another front, the Divinity School will be developing its programs in world religions, especially through the existing Center for the Study of World Religions. The recent appointment of a new director for the Center, a specialist in South American and African religions, has helped revitalize the Center's mission. Additional development is envisaged in Islamic and Buddhist studies. The School also plans to strengthen its excellent program in Women's Studies in Religion, and its work in African-American religious traditions (where an important senior appointment has recently been made). These are further examples of the School's concern to extend its reach into areas where it can collaborate with other parts of the university. Finally, the School is car-

rying out a redesign of its programs in education for the ministry, a clear priority for the next decade.

The Graduate School of Education

The School of Education plans a major effort over the next decade to contribute to the improvement of public school education in the United States. There are obviously many serious problems affecting our public schools, and no one believes that fundamental progress will come easily. But a national process, with many promising experiments, is now under way.

The School has identified five broad priorities or themes to help guide its future efforts. The first concentrates on family and community. This involves, among other things, a new specialization in "risk and prevention," which focuses on specific risk factors faced by children from poor or highly stressed families. The goal is to design effective—and early—forms of intervention. The Harvard Family Research Project will also play a role in the effort to help form closer and better working relationships among schools, families, and community groups.

The second theme centers on policy and management, and includes the School's special training programs for urban superintendents and for school principals. These are extremely important programs, because they have the capacity to affect the design and the leadership capacity of entire schools and school systems. A new Center for Research on Urban Educational Policy will be linked to the programs for principals and superintendents, and all of these efforts will involve participants from both the Kennedy School and the Business School.

The third theme—teaching and learning—continues the School's study of "what works" in different classroom settings. Which approaches to teaching, to the curriculum, and to the design of classrooms or schools are likely to be most effective in different localities or environments? Addressing such questions will require, among other things, efforts to link research to practice by continuing to strengthen our cooperative relationships with local schools and teachers.

The fourth theme—national dialogue—draws on the School's exceptional strength in policy analysis. The School recently

initiated a series of forums for the analysis and discussion of major educational policy issues, such as school choice programs, national testing, and alternative assessment methods. This forum project involves not only public events, but also related publications and semester-long visits by distinguished practitioners. The aim is to frame the issues related to major national debates on the subject of school reform, and to follow up with further analysis and evaluation.

Finally, the School is taking a leadership role in the Project on Schooling and Children. This joint effort with several other Harvard Schools and Faculties is described more fully at a later point in this report.

The John F. Kennedy School of Government

The Kennedy School's goal is to prepare leaders for service in government and public affairs, while also contributing to the effort to find solutions to important public problems. The need for leadership in government and other public service organizations has never been greater—and the need to educate students and professionals who are committed to public service could scarcely be more urgent.

Developing additional capacity in several priority areas that have a domestic focus—but whose implications are often international—is the School's principal challenge. These areas include health care, public school education and governance, domestic political economy, the environment, and the management of not-for-profit enterprises. All of these subjects are of interest to several other Schools at Harvard, and offer the Kennedy School important opportunities to build cross-Faculty connections. In addition, the School plans closer links between its different research centers and its various teaching programs.

The School will also build on the international initiatives—involving teaching, research, policy analysis, and strategic advice—that have characterized so many of its activities in recent years. These include, for example, projects in the former Soviet Union relating to economic development and the creation of free markets; Project Liberty, which has cosponsored conferences and exchanges on democracy for public officials in Eastern Europe;

the Program on Economic Reform in Ukraine; a set of related planning projects in South Africa; and the Mason Program in Public Policy and Management, which brings to the School experienced policymakers from developing and newly industrialized countries. In short, the international agenda is already densely packed, and will clearly remain so.

Finally, the School is reviewing its approach to teaching, with an emphasis on integrating the analytic skills that support policy analysis with the management skills that enable policy execution. The fundamental issue at stake, of course, is the challenge of educating individuals for public leadership during a period of rapid global change. The greater scale, complexity, and heterogeneity of institutions and societies; the need to forge consensus when the possibility for achieving it is often so sharply constrained; the widespread decline in respect for legitimate forms of authority; the potential global implications of many local events; the prevalence of organized violence and terrorism, as well as contagious random violence—these and other factors make the process of governance and the exercise of public leadership a particularly difficult problem in our contemporary world. For the Kennedy School especially, the shifting and unpredictable nature of domestic and international situations will continue to present difficult choices—and new opportunities—concerning what to teach and how to teach it, as well as how to integrate scholarship with practice.

The Law School

The Law School is currently building its capacity in select fields that are especially important to evolving legal scholarship and practice. These include key areas such as health-care regulation, environmental law, immigration law, and the administrative and economic law of the European Community—as well as the field of international and comparative law more generally. The newly dedicated Reginald F. Lewis International Law Center will help strengthen this latter effort, as will the recently created Center for Islamic Legal Studies—which joins the existing programs in East Asian legal studies, human rights, international taxation, and international financial systems as part of the School's broad-based program of international legal studies.

Besides developing new courses in select areas, the School is also in the process of increasing the opportunities for small-group teaching and learning. Planned additions to the faculty—and a greater number of small classrooms, in locations including the new Holmes Field building—should make it possible for every student to take at least one small-group seminar each year. As part of this renewed emphasis on teaching, the School also intends to strengthen its clinical program: the new Legal Services Center in Jamaica Plain will be one important ingredient in the effort to link classroom work with field experience.

Various research programs—including the Program on Negotiation, the Program in Law and Economics, the Program on the Legal Profession, and several others—will continue to require steady support, as will the broad range of research activities undertaken by individual faculty members. An extremely important rehabilitation of Langdell Library is also planned. Finally, the School will continue to strengthen its programs of financial aid, including the Low Income Protection Plan and the Kaufman Fellows program, both of which seek to encourage graduates to pursue careers in the public interest.

The Faculty of Medicine

The Medical School will move forward to the next stage of implementing its New Pathway program, a major initiative that is transforming the nature of education for the M.D. degree. Students in the program are assigned to one of five "societies," each of which is intended to function as a cohesive community of teachers and students. It is to these societies that responsibility for the course of study and its continuing renewal will be entrusted. The program places great emphasis on case studies, seminars, and small classes—formats that engage students actively in the process of learning, working individually and in teams to explore the origins of clinical problems and the ways to manage them. Full implementation of the program will continue to require a considerable investment of time and resources. But the New Pathway has already broken important new ground, and when fully in place it will represent a truly fundamental restructuring of medical education.

The Medical School intends to build a more powerful effort in a few select fields where intensified basic research is especially likely to hasten the cure or better treatment of serious disease. These areas include structural biological chemistry, where advances are deepening our understanding of the shape of proteins that play essential roles in all forms of life, from viruses to human beings; cell biology and experimental pathology, with particular attention to cell division and differentiation and their relation to cancer; immunology related to AIDS, transplantation, and autoimmune disorders such as diabetes and arthritis; and neurobiology, critical to our understanding of how brain functions affect perception, movement, cognition, and mood. Investment in new technology will be extremely important to moving forward in several of these areas and others.

The School also plans to bring greater cohesion and more effective structure to its many clinical departments. Psychiatry and ambulatory care are leading examples of areas in which this effort is under way. Concurrently, the Medical School and its affiliated institutions (of which there are now 17 hospitals and other organizations) have begun discussions to evaluate the impact of changing patterns in the delivery of medical services on the academic and patient-care missions of the institutions. The goal is to find ways to continue the close cooperative arrangements that have existed for so long, while also undertaking the degree of adaptation and change that will be necessary to ensure continued improvement in the quality of health care through research and education in the years ahead.

The Dental School (part of the Faculty of Medicine since 1990) is reviewing its D.M.D. curriculum with an eye toward integrating more problem-based approaches into the last three years of the program. The School is continuing to review and reorganize its departmental structure, and a new clinical center, housed in the School's main facility, has just been completed.

The School of Public Health

The School of Public Health remains dedicated to studying and improving the health of populations throughout the world. Its outlook extends well beyond the care of individual patients to the study of how our health depends on the way we live, the way we work, and the way we interact with our environment.

The School offers programs leading to both doctoral and master's degrees. It has recently redesigned—and is continuing to develop—the curriculum for its master's (M.P.H.) program. The program has been rebuilt around five interdisciplinary, career-related concentrations: international health, health-care management, public management and community health, occupational and environmental health, and quantitative methods. Strengthening the program's core offerings on public health principles and highlighting the ethical dimensions of public health practice are also important parts of this redesign project. In this respect, the recently established program on health and human rights is a vital step forward in the School's work.

In addition to curricular redesign, the School is experimenting with different approaches to teaching. It has begun to make greater use of case studies, small-group discussion, and a mix of field experience and classroom learning in seeking more effective ways to approach problems that require insights drawn from many fields or disciplines.

As the School looks ahead, its research activities are taking shape in five principal thematic directions. First, there is the drive to confront some of the most threatening diseases of our time: cancer, AIDS, and heart disease. The School has an active interdisciplinary center devoted to each of these areas. Second, the School is analyzing and assessing health-care delivery systems in the United States and abroad, helping to address the need for more equitable, cost-effective ways to provide high-quality care to large populations. Third, the School brings a strongly scientific approach to the analysis of environmental hazards, in its effort to help design strategies for healthier indoor and outdoor environments. Fourth, the School is home to the world's most comprehensive study of diet and health, and will press forward with its studies of how behavior, nutrition, and life-style factors influence public health and in turn may be influenced through communication, education, and public policy. Finally, the School is working to strengthen scientific, analytic, and decision-making capacities in developing countries, many of which face formidable problems of disease but lack the means to combat them.

4. SUMMARY

EARLIER I DREW ATTENTION to a number of broad common themes and directions suggested by the plans of Harvard's different professional schools. It is now possible to glance back for a moment, and summarize some of the quite specific ideas that recur in many—though not all—of the Schools' plans. A short list would include:

- A strong emphasis on the idea of education for leadership, and a concern for the development of the values, qualities, and capacities that good leadership requires.

- A strong interest in virtually all aspects of international studies, consistent with the university's goal of remaining an international as well as a national institution.

- A focus on certain fields of study—related to important problems in society—that rank consistently high on the priority list of many Schools. These include health care and health-care systems, environmental studies, and public school education—to name just a few that are most frequently mentioned.

- A commitment to more effective teaching and learning, with a strong emphasis on small-group classes and seminars; a greater reliance on case studies that can focus attention on complex problems requiring active inquiry and debate; a recognition of the need to realize the benefits of modern technologies in the classroom as well as in research; and an increased interest in student internships, fieldwork, or similar activities to help ensure that we do a proper job of connecting practice with formal academic study. In School after School we find that investments in additional faculty—however modest the numbers—are closely linked to investments in better teaching.

- A recognition of the benefits to be gained from integrating fields of knowledge, and from collaborating—when appropriate—with different parts of the university in order to make more effective use of the resources we already possess.

Part IV. Crossing Boundaries

THE PREVIOUS TWO PARTS of this report have concentrated on plans and activities specific either to the Faculty of Arts and Sciences or to the professional schools. This section concentrates on several activities that reach more broadly across Harvard as a whole. If they are not literally university-wide in all their aspects, they nevertheless involve many different units and have the potential for even broader development.

1. INTERNATIONAL DIMENSIONS

IT IS CLEAR THAT THE WORLD has become a smaller place: information and ideas—as well as movements and patterns of action—cross national and regional boundaries with a speed and intensity we could scarcely have imagined even a few decades ago. This heightened sense of interconnectedness raises major questions for the university. How can we best educate our students to live and work effectively in an increasingly globalized society? How can we foster programs of research that bridge not only intellectual boundaries, but international ones?

Whether the particular subject is world religions or international financial systems, the environmental impact of economic development or the emergence of fledgling democracies abroad, these questions are now receiving an unprecedented degree of attention across the university. And our emerging initiatives build on a base of exceptional strength. As already noted, the plans of many of our professional schools reflect a strong common emphasis on international programs and perspectives. Within the Faculty of Arts and Sciences, that emphasis is no less clear.

A recent survey, for example, showed that nearly 40 percent of all courses in the Faculty of Arts and Sciences—and about 45

percent of all Core Curriculum courses—have a significant international dimension. Meanwhile, scholarship in international and area studies continues to flourish, largely (but by no means exclusively) through a broad range of research centers, institutes, and program committees. Within the FAS alone, these units range from the Center for International Affairs to the Russian Research Center and the Ukrainian Research Institute; from the Center for European Studies to the Fairbank Center for East Asian Research and the Reischauer Institute of Japanese Studies; from the Center for Middle Eastern Studies to the Harvard Academy for International and Area Studies; from committees devoted to the study of Latin America, Africa, and other regions, to our many museums with their collections drawn from every part of the world. Beyond Arts and Sciences lies a further array of international programs and centers, too numerous to identify here.

There is also a wealth of other activities that are international in nature, if not in name. These include—among many others—studies of constitutional government and human rights; of public health and health-care systems; of modernist art and architecture; of manufacturing and trade; of warfare and terrorism (as well as peacemaking and negotiation); of gender and race and ethnicity; and of the ways in which new technologies or scientific discoveries move from region to region, transforming how individuals and societies organize their lives.

In short, the university-wide agenda for international studies is rich and substantial. And our community of international students and scholars is large and strong. Throughout the university, nearly 2,700 citizens of more than 110 foreign countries are enrolled in Harvard degree programs—nearly 15 percent of all our degree candidates. (The figure is 7 percent in the College, higher in most of the professional schools.) Within our faculty ranks, we continue to seek and attract outstanding scholars from all over the world. And, apart from the students, faculty, and staff in residence from other countries, dozens of foreign visitors come to the university virtually every day—to give speeches or informal talks, to teach a class or seminar, or simply to meet with people who work and study here.

Meanwhile, more and more of our students and faculty travel abroad on exchange programs, for special projects, or purely to

become more familiar with other countries and cultures. And new technological resources such as the Internet—an electronic network that links universities and other institutions around the globe—are literally bringing worlds of information and interactive communication to scholars in their offices, or to students in their rooms. The presence of the wider world is increasingly evident on campus, wherever one looks.

The sheer scale and variety of Harvard's international pursuits make it hard to contemplate a single university-wide structure that could effectively oversee and coordinate all of them. Our approach has been, and must remain, more multifaceted. We need to assemble flexible networks of individuals and groups to work together on specific projects, even as we continue to support centers, institutes, and departments devoted to the study of particular languages, cultures, countries, and regions. We need organizations and programs that are committed to societies and nations defined geographically; but we also need cross-cultural and cross-regional comparative studies, as well as studies that focus on transnational systems, movements, and processes of different kinds.

Against this background, our broad goals and priorities in the international realm include the following:

- *To be cosmopolitan in our outlook—by integrating international perspectives into our scholarship and teaching, by keeping our community accessible to students and scholars from many different nations and cultures, and by providing students from the United States with appropriate opportunities to study and work abroad.* We want students from throughout the world to have some experience of our own society, and we want to contribute to the education and training of leaders throughout the world. At the same time, we want students from the United States to understand the perspectives of people from other cultures—through courses of study that capture the international dimensions of contemporary life, and through opportunities to meet, work with, and come to know their peers from other societies. While the latter aim can be achieved in part by maintaining an internationally diverse campus community, we must also provide increased opportunities for American students to pursue research projects in other countries, as well as to take advantage

of summer internships, special language training, and formal academic programs overseas.

- *To strengthen our regional and international centers and programs, so that they can continue their fundamental work studying and teaching the languages, history, and culture of different societies.* This will require, as suggested earlier, more and better space for the different programs and groups based in Arts and Sciences—especially space that allows different centers and institutes to cooperate on joint projects, conferences, and other activities that cross boundaries. It will also require identifying and taking advantage of natural affinities between the centers based in Arts and Sciences and related activities in the professional schools.

- *To add more faculty (within the number of new positions already cited) in fields of special importance to our international efforts.* As is clear from the plans of the different Schools, East Asian studies, Middle Eastern and Islamic studies, and Latin American studies are important priorities in many parts of the university. Meanwhile, our strength in European studies is already exceptional, but must be constantly renewed. Recent appointments in African studies as well as Afro-American studies have buttressed our work in those areas. Finally, as one would expect, there is much interest and activity now—and a need for extra support—in Russian, Ukrainian, and "former Soviet Union" studies (as well as studies of Central and Eastern Europe).

  We cannot possibly aspire to cover all regions of the globe—indeed, there are vast areas where we do little if anything—because each one of these special fields is complicated and extremely expensive to address properly. It can take decades to build a strong program in any one area, because so much depends on having adequate library resources, outstanding faculty in several disciplines, and sufficient endowments to fund research, travel, exchange programs, and other activities. But in those areas where we already have programs or centers, we must ensure their capacity to remain very strong at a time of vast international challenge and change.

- *To develop flexible means to encourage and support promising initiatives in topical (as distinct from regional) fields.* The intention

here is not to establish new centers or formal programs, but to make it possible for faculty and students from different departments and Schools to pursue some of the complex cross-cutting topics already described. For example, in recent months groups of faculty members have proposed projects on such timely themes as democratization, ethnic conflict, and international migration. New courses, advanced seminars or colloquia, and limited research projects could be supported from a flexible fund that provided seed money for the most promising ventures of this kind.

Given the considerable sweep of our international activities, and the excellent programs that have been developed over the course of many decades, we are unusually well positioned to move ahead: to advance understanding of what is happening in the world as it evolves, and to educate students so that they can comprehend events and act as effective leaders.

2. ADDITIONAL INTER-FACULTY INITIATIVES

ANY NUMBER OF PROGRAMS AND PROJECTS within the university involve several different Faculties or Schools—including many of the international activities just discussed. The initiatives that will be described in this section are highlighted because they have only recently begun to function as defined academic and administrative units, and because they involve subjects identified as important priorities in the plans of several different Schools. The areas are ethics and the professions; health policy; environmental studies; schooling and children; and "mind, brain, and behavior." Here, as in other spheres, the focus lies not on creating large-scale and autonomous new entities, but rather on strengthening connections among the university's different parts.

Each of these initiatives concerns a very large topic, and none of them makes any pretense of covering more than part of the broad area in question. Large numbers of faculty and students pursue each of these subjects, every year, in countless ways that cannot possibly be captured by the particular programs described below. The special value of these programs, however, is that they

can help define a more manageable institutional agenda, by targeting specific issues for more systematic collaborative work. In this sense, they constitute another way in which the university can address some of the more pressing problems that now face our own society and others.

Ethics and the Professions

Education at Harvard is concerned intrinsically and pervasively with values and ethics. In our academic programs—as well as in other activities—we insist on honesty and integrity, on hard work and high standards, on the need for individuals to take responsibility for their actions. We emphasize the values of tolerance, mutual respect, and understanding—the need not only to develop one's own convictions, but also to live with and learn from people who have very different backgrounds and views. And we are firmly committed to the fundamental values of free inquiry and expression—a commitment that requires a robust institution capable of thriving on energetic discussion, argument, and debate.

Education that touches on ethics and values takes place in countless settings, every day, throughout the university—as in the important work of Memorial Church, the United Ministries, Hillel, and other religious organizations. Public service activities and other extracurricular pursuits make another kind of contribution—as do the daily conversations that students have with proctors and tutors, faculty and staff, and one another. Learning about values and ethics also has an important place in the formal curriculum—in the moral reasoning component of the Core Curriculum, in the teaching of professional ethics and responsibility at the professional schools, and in the syllabus for any number of individual courses offered by various Faculties and departments.

Among our many activities and programs, the Harvard University Program in Ethics and the Professions has a distinctive place. It starts with the assumption that many developments in contemporary life have created ethical problems that often depend on technical or highly specialized knowledge—and unusually complicated moral reasoning—for their resolution.

Technology and science have played a large part in creating the circumstances that underlie these new dilemmas. In medicine, for

instance, there are all the difficult questions posed for individuals, families, physicians—and the legal system—concerning decisions that affect the ending, or the very beginning, of human life. In addition, the more we learn about our genetic structure and the causes of disease, the more we will be able to make reasonable predictions about the future—how certain inherited traits, certain habits, or certain parts of our environment are likely to increase (or decrease) our chances for healthy lives. What kinds of interventions will we accept as permissible in order to increase the life-chances or health of individuals (and populations)? How much regulation of behavior will seem acceptable?

There are similar problems in the zone between private and public life. New technologies can provide official agencies and other organizations much readier access to a great deal of information about the private affairs of individuals—including credit ratings, employment history, and much more. How do we control access to such information? How do we protect the rights of individuals? When does the public—or certain agencies—have a legitimate right to know? How do we know who knows?

The Program in Ethics and the Professions does not presume to prescribe the "correct answers" to such dilemmas. But it does subject them to the collective scrutiny of a group of faculty, visiting fellows, and advanced students from the different professions as well as other relevant disciplines (such as moral philosophy, political theory, and religious studies), who are brought together for an intensive year-long seminar. Fundamental readings, as well as selected case studies, are used. The participants become bilingual: they learn to master the knowledge and language of specific professions, as well as the language and logic of ethics, in order to study some of the most important and difficult problems facing contemporary professionals.

The Program has already had a significant impact through its education of future faculty and practitioners. Several of the Program's alumni have become faculty members at Harvard's own professional schools, and they are introducing new materials into the regular curriculum and research programs of their Schools. Others have returned to their home institutions to develop new courses and programs. This important ripple effect is an excellent

example of how a program that is small in scale, but university-wide in its structure and implications, can make its presence felt directly on education and society, both close to home and beyond.

Environmental Studies

Nearly all of Harvard's Schools and Faculties have identified environmental studies as one of their key priorities, and every School is represented on the recently established university-wide Committee on the Environment. Formed only last year, the Committee has already created a new focus for a wide array of Harvard's research and teaching programs that relate to the environment.

In one of its first signal achievements, the Committee gained full faculty approval this past spring for a new undergraduate concentration in environmental studies. The concentration has a strong science core, and also includes substantial work in public policy. Although new and demanding, it is already attracting an impressive number of talented students.

The Committee will identify a major theme each year—or every other year—to serve as focal point for collaborative research, seminars, lectures, tutorials, and special publications. The first topic will be the tensions between economic development and environmental protection in China. The project will shed light not only on the Chinese situation, but also on similar problems faced by many other countries and regions as they try to develop their industrial base without doing severe damage to their own environment, or that of the world. Through this project and others, the Committee will bring together individuals from many disciplines, and will also help to bridge the gap between basic research and its practical applications. Again, the core of this program is deliberately designed to be modest in scale, but powerful in focus, and strong in its outreach.

Schooling and Children

Some of the problems facing the nation's public schools have already been mentioned in a previous section of this report. As we know, those problems involve much more than curriculum and

pedagogy. The social fabric of neighborhoods and communities, the condition of families, the health and nutrition of children, the economic predicament of many cities and towns, the prevalence of violence and substance abuse in many areas, the interplay of race relations and housing patterns and poverty—these and other factors all bear strongly on the large question of "schooling and children."

The Project on Schooling and Children will be led by the Graduate School of Education, in close cooperation with the Kennedy School, the School of Public Health, the Faculty of Arts and Sciences, the Business School, the Law School, and other parts of Harvard. Its activities will include important cross-School research projects, public colloquia and forums, special seminars, advanced training programs, and joint work with local public schools and other educational organizations.

The Project's agenda will include a focus on timely questions of public policy, such as alternative approaches to the concept of school choice, or proposals for national testing. It will also grapple with specific problems faced inside the schools (such as how to improve teaching in math and science, or how to develop effective after-school programs) and in the surrounding communities (such as how to involve parents in the educational process, or how to deal with the question of responsibility for children's health care, nutrition, and other needs). The aim is not to cover all aspects of this complex field, but to concentrate on important specific problems that are well suited to the kinds of research, teaching, and fieldwork that a university can undertake. Our public schools clearly face enormous difficulties, and Harvard is fully committed to doing whatever it can to help.

Mind, Brain, and Behavior

Recent advances in neuroscience and related fields are teaching us far more than we have ever known about the brain and how it functions—especially how different sectors of the brain affect behavior in very precise ways. The more direct connections we discover between identifiable parts of the brain and human actions or functions (related to memory, vision, perception, speech, feelings, and our capacity to reason), the more we may find remedies for

physiological or psychological problems: new therapeutic drugs or medicines, new forms of neurosurgical or similar interventions, or new ways to correct for damaging genetic defects.

In addition, the more we discover those parts of our being that are largely "chemical" or "electrical" in nature, the more challenging it is to develop adequate ways to define and explain those parts of ourselves that are less closely linked to purely physiological functions. How is the mind different from the brain? How do we account for our sense of a "self" that has intentions, that acts freely, and that is somehow much more than our purely physical body and brain? These are age-old questions. What makes them challenging in fresh ways is the far greater amount of knowledge and understanding that we now possess—and the improved technology enabling us to press forward even further.

The inter-Faculty initiative on mind, brain, and behavior will involve people from many disciplines: medicine, the biological sciences, psychology, religion, computer science, philosophy, and cultural anthropology, among others. The goal will be to carry forward research in all the relevant fields, choosing special topics—the topic of addiction is one example—that demand an analysis of the interactions among the brain, the mind, and behavior. By concentrating on a specific problem such as addiction, for instance, faculty and students will be able to analyze how the brain functions when it is affected by certain substances. They can trace in detail the effects on different aspects of human behavior (including everything from vision, to changes in mood, to more overt actions). They can also test alternative therapies—such as the choice between chemical (e.g., methadone) and rehabilitative (e.g., behavioral) approaches to the treatment of drug addiction. And they can compare the attitudes, in different societies, toward the use of particular substances: why the same drugs may be regarded as dangerous, or medicinal, or an acceptable part of certain social (or religious) rituals in different parts of the world.

As this example suggests, the initiative on mind, brain, and behavior offers an unusually exciting chance to stimulate interdisciplinary discussion of fundamental questions about human nature, while also addressing individual and social problems of profound practical importance.

Health Policy

Harvard has long had many faculty—spread among several Schools—involved in issues relating to health care and health policy. In the last two years, however, a new university-wide program has been established at the doctoral level to educate and train individuals from several disciplines who want to become experts in different aspects of health policy. Candidates can choose to concentrate on health economics, the health-care system, the practice of health care, and other important topics.

Given the great complexity, cost, and significance of health care, it is obvious that we will continue to need—well into the future—people who are highly trained and versatile, and who can help to analyze, design, and manage our evolving systems. Whatever happens in the field of health care in the short run, the basic issues and problems will not be solved in any permanent way. We will have to be ready for continual readjustments and periodic major changes—indefinitely. The long-range challenge of educating a cadre of individuals to provide continuing advice, analysis, and leadership is extremely important.

The new program is off to an excellent start. This year's incoming class is slightly larger than last year's, and the quality is exceptionally high. In addition to the doctoral program, there are also master's programs in selected professional schools. Stipends for students, start-up research grants for faculty, and some funds for course development will all be important to the program's continued success.

The inter-Faculty initiatives just described vary in their structure, scale, and approach. Some are engaged in a full range of activities, including undergraduate and graduate education, research, and various efforts at outreach to the outside community; others are more limited in scope. Some involve every, or nearly every, School; others, only four or five. But all the programs have at least two important characteristics in common.

First, each tries to bring together existing talents and resources from different parts of the university, to help coordinate and intensify our efforts in an important field. In an institutional setting like

ours, this task is far from easy—but the developments to date have been encouraging.

Second, each program deliberately sets out to address a cluster of serious problems confronting society. The agenda is ambitious, and "solutions" clearly lie far beyond the reach of any one institution. Yet progress, however difficult and sometimes erratic, can be made. If individuals from across the university's different parts are encouraged to combine their energies—with one another, and with others outside Harvard—the cumulative effect can be powerful indeed.

3. LIBRARIES AND INFORMATION TECHNOLOGY

IT HAS BECOME ESSENTIALLY IMPOSSIBLE to talk about libraries, and to plan for their future, without also taking into account the present pace of technological change. Nearly all aspects of our library and information technology systems have been reviewed carefully during the past two years—by committees of the Overseers, by the offices of both the University Library and the College Library, and by other groups. Not surprisingly, the plans of nearly all our Schools and Faculties devote a great deal of attention to libraries and information technology. Details vary, but the general message is a consistent one.

The library of the future will differ markedly from libraries of the past. Our libraries will continue to collect and circulate millions of books and journals, and to store and preserve many kinds of materials—from rare books, to archival collections, to the most recent monographs. But libraries will also make information available in a far greater variety of ways, and a library will be—indeed, it is already being—conceived less as a single discrete physical space than as a gateway to a complex of networks involving many different spaces, media, communications links, and information sources.

Acquisition and possession of published materials will obviously remain very important, but ready access to the world of information outside (as well as within) the library's walls will become an increasing priority. As more and more texts and images and

audio materials become available electronically, our faculty, students, and staff will need the ability to "tune in" with the same ease and rapidity that we now associate with radio or television. For all the changes we have already seen in the past few years, we are only at the beginning of an era that will dramatically expand the capacities that even now exist.

To remain current, we will need to extend the networks that are already in place in many parts of the campus, moving quickly to a point where most or all of them can be connected to our high-speed fiber-optic "spine." Additional local networks—connecting dormitory rooms, offices, and other locations one to another—must also be developed. There are parts of Harvard in the forefront of such developments, and pressing the frontiers of what can be done. But there are many other places where we are seriously lagging, and can no longer afford to do so. It will be very expensive to create the new systems and maintain them, but not to do so would—in terms of education and research—be far more costly.

Describing the many steps that this enterprise will require would take an entire report. Let me mention only a few highlights. First, we are well on our way to completing a comprehensive university-wide electronic catalogue covering the millions of books and journals in our collections. This catalogue allows users at the library or at remote locations to find out whether Harvard owns a particular volume, where it is located, and whether it is currently checked out. A significant part of the catalogue (known by the acronym "HOLLIS") has come on-line over the past few years, and the project should be complete within the next three to five years.

The Veritas Information Network, or "VINE," is another important component. This computer-based network includes current Harvard job listings, a faculty and staff directory, events calendars and newsletters from different Schools and departments, a variety of information for undergraduate and graduate students, and an ever-expanding list of additional items. In addition, through the software application known as "Gopher," all the courses offered by all Harvard's different Faculties and Schools have now—as of this year—become searchable by computer. Rather than have to flip through hundreds of pages of different

catalogues, a student can now sit at a terminal and discover, within seconds, the various courses offered throughout the university that touch on a particular subject matter: whether childhood development, or macroeconomic theory, or biotechnology. This leap in access should help students take much greater advantage of educational opportunities not only within their own Schools, but throughout Harvard.

The new technology will also make available an increasing variety of electronic texts—from the complete works of Shakespeare to the Koran, from vast archives of popular music lyrics to current and historical government documents. And the information can be readily searched and manipulated. For instance, a student interested in tracing a specific concept in Greek philosophy can consult virtually all recorded references in all the relevant texts, and follow the concept's evolution from writer to writer.

The possibilities for research are too numerous to describe. Consider, for example, that it has become possible for scholars at Harvard, using their own desktop computers, to monitor direct astronomical observations taking place in Arizona; or to study "flexible manufacturing" and its implications for competitiveness, using factory automation data gathered from various countries; or to examine and process the medical scans of patients located in hospitals in distant regions of the country or the world. From these examples, and many others, it is clear that the modern scholar's library reaches far beyond the confines of a particular building. One must think in terms of an international universe of information, accessible through networks that link Harvard's parts to each other and to unlimited regions beyond.

The implications for planning are dramatic, and the need for coordination throughout the university essential. As stated in the University Library's Ten-Year Plan (1992):

> When libraries were collections of books and journals within the four walls of a library building, the relationship between [the central Harvard University Library] and the constituent libraries [in the different Schools] was fairly straightforward. There were few activities that needed coordination. . . .
>
> Our libraries are no longer able to function in such isolation. Interdisciplinary research, decreasing duplication in the collections, the growth of cooperative national programs, and the influence of information technology require increasing levels of cooperation and joint activity . . . .

The growth of electronically-based collections, collections which live in networks rather than in buildings, will certainly intensify this trend.

In this sphere, as in others, joint activity among distinct units has become necessary to the advancement of knowledge, effectiveness in teaching, and the creation of an even stronger university.

Part V. Keeping Doors Open

HARVARD MUST REMAIN open and accessible to people of all backgrounds and points of view. As an intellectual community, we depend and thrive on the free exchange of ideas. As a human community, we gain great strength from the presence of women and men whose collective diversity is as rich as their individual talents are exceptional.

At the undergraduate level, we will continue to admit the most outstanding candidates we can find, and to provide adequate financial aid to those with demonstrated need. "Need-blind admissions" and "need-based aid" will remain central principles.

For graduate and professional school students, the situation is more complex. In many fields, the financial need of advanced students is especially acute, and the sources of funds are unusually scarce. Higher education faces a growing financial-aid crisis at the graduate and professional level—a situation that badly needs attention and redress.

With regard to faculty, as well as staff, Harvard will continue its vigorous efforts to attract and retain excellent individuals from a wide range of backgrounds. Competition for the very best people has become intense, and is likely to remain so—especially if the proportion of college graduates choosing to enter the academic profession fails to increase in many fields, and if the associated "pipeline" problems persist. Progress has been made in many areas, but improving the situation for women and members of minority groups in the academic profession will continue to demand concentrated attention.

1. THE COLLEGE

Approximately 6,600 undergraduates typically enroll each year in Harvard College—roughly 1,650 per class. The quality of the

student body has never been higher. The College's "yield" of about 75 percent (the proportion of people offered admission who choose to accept it) continues to outpace that of our peer institutions by a substantial margin (approximately 20 percent). The level of talent and achievement within each year's entering class—whether measured by test scores or by the energy and creativity evident on campus every day—remains extraordinarily high.

The diversity of the student body is impressive along many dimensions—intellectual, geographical, extracurricular, and otherwise. Nine of every twenty students in this year's entering class are women. Nearly one-tenth are African-American; nearly one in five, Asian-American; nearly one in twelve, Hispanic-American; and nearly 3 percent from other minority groups. The figures fluctuate somewhat from year to year, but the numbers remain strong.

Undergraduate candidates from all financial backgrounds continue to apply and gain admission. More than 70 percent of the students in this year's entering class are on financial aid. Roughly 45 percent receive direct scholarship grants averaging nearly $12,000, plus other forms of aid (including loans and jobs) averaging about $5,600. The other 25 percent of students on aid receive loans and income from jobs (and some outside grants) that together average about $5,600.

In other words, *nearly half of all our first-year students are receiving total financial-aid packages that average roughly $17,500, against total annual fees of slightly less than $25,000.* Some especially needy students receive virtually full support; others who are less needy receive proportionately less. Most of our aid helps families with incomes of $25,000 to $75,000 per year. But nearly one in ten students on scholarship aid comes from a family that earns less than $10,000 a year, and nearly one in ten from a family that earns more than $100,000. Everything depends on individual circumstances and demonstrated need. This year, Harvard will provide more than $30 million in scholarship aid—outright grants—to undergraduates alone.

These figures help underscore what is not always evident from public discussion and debate concerning the cost of college education: the strength of Harvard's determination (and Harvard is certainly not alone) to remain open and accessible to students from

families across the economic spectrum, primarily through the provision of need-based aid. Indeed, for the past twenty-five years, including periods of relatively rapid tuition increases, there has been a steady and powerful commitment to access and affordability. The rate of growth in Harvard's financial aid expenditures has more than kept pace with the rate of tuition growth, helping to keep college within the reach of students in need, even during a time of relatively stagnant family incomes.

We should also keep in mind that, in a real sense, every student at Harvard College receives another form of scholarship or subsidy: even students and families who pay our full fees are not charged what it actually costs to provide a year's education (including room, board, and other services). According to our best recent estimate, that cost is at least $10,000 more per student per year than the current full fees of nearly $25,000. In effect, all students receive a significant annual subsidy made possible by gifts and endowment funds that have been generously contributed to the university, year after year, for more than three centuries.

None of this should lead us to underestimate for a moment the severe problems faced by so many students and families struggling to pay for college. Those problems are acute, and are a constant concern to all of us. In this respect, we must not only continue to strengthen our student-aid programs, but also work to moderate tuition increases by cutting costs and controlling expenditures. This approach has already achieved some success. Tuitions at Harvard (and many other leading private colleges) have increased much more moderately since about 1988, compared to the previous decade. Sustained low inflation has been a key factor in this equation, but effective economies and budget controls have been important as well.

At the same time, we cannot lose sight of a point too rarely mentioned in discussions about college costs: we need to recognize that budget controls cannot in themselves be counted on to bring the full cost of excellent private colleges and universities within the reach of the average middle-income family. There is a tendency to look back on the past as a time when many things—including a college education—were much more easily affordable than they are now. In fact, however, the full price of attending our leading

private colleges has always been high relative to the vast majority of family incomes—because private institutions have always had to rely primarily on student fees, together with endowment and gifts, to meet the high costs of educating their students. That is one reason why state-subsidized colleges, state universities, and "free schools" were originally created. It is also the main reason that scholarships have always been regarded as the only feasible way to make private colleges affordable to students from low- and middle-income families.

Given the actual expense involved in providing any education (whether public or private) of the highest quality, and given the fact that private colleges do not—quite appropriately—receive the large-scale state subsidies that their public counterparts do, it is unrealistic to expect that the costs of attending our leading private colleges and universities can be moderated to the point where the great majority of families could afford to pay them in full. But that is by no means the same as saying that students from low- and middle-income families will be denied access to Harvard. Now, as before, broad access can and will be made possible through need-based financial aid: the very same strategy that led to the great expansion of access beginning with the GI Bill and continuing with the even more extensive programs launched in the 1960s and 1970s.

Indeed, the critical point to grasp is that our best private colleges and universities have never in modern history been more accessible and affordable—to a wider range of students from middle- and low-income families—than has been the case in the past twenty years. To discuss fees without simultaneously discussing the immensely increased availability of financial aid is simply to omit an entire side of the college cost equation.

In the future, therefore, we will remain committed to providing different forms of aid, in varying amounts, to those undergraduates who need assistance. Beyond that, we must ask those students whose families can afford to pay full fees to do so—keeping in mind that even they benefit from a considerable annual subsidy. Need-based aid continues to be the most effective (and *cost*-effective) way to keep the doors of Harvard open, and scholarship funds will consequently remain one of our highest priorities.

Together with job opportunities and loans, these funds dramatically reduce the effective cost of a Harvard education. They also create a very effective partnership: the College provides the overwhelming proportion of need-based scholarship funds (at Harvard, roughly 85 percent) in addition to many student jobs; the student invests in his or her own education through jobs and loans; the family pays what it is able to afford; and the federal government (along with many states) provides critical support, through the guaranteed loan program, college "work-study," Pell Grants, and other means. All the components of this partnership—including the many contributions from private organizations and individual donors—will remain critical to ensuring that the most outstanding students, whatever their backgrounds and financial means, can continue to attend the best private colleges and universities in the nation.

2. THE GRADUATE AND PROFESSIONAL SCHOOLS

STUDENT FINANCIAL AID is also one of the highest priorities in the plans of virtually all of our graduate and professional schools. It is not hard to understand why. Most students, often fresh from college, lack significant resources of their own. Their families commonly do not feel the same sense of obligation to help pay for advanced studies as for undergraduate education. Government and foundation support for graduate study in many (though not all) fields has fallen precipitously during the past two decades. And the universities themselves, while offering significant aid in various forms, are not in a position to bridge the entire gap that remains.

As a result, many students borrow heavily. The following table shows, for select major degree programs at Harvard, the percentage of 1992 graduates who relied on some form of financial aid (grants, loans, or other) to help finance their graduate or professional education. In addition, it shows the average debt burden (rounded to the nearest thousand) of graduating students who relied on loans to help finance their graduate or professional education:

Graduate School of Arts and Sciences	88%	$15,000
Business School (M.B.A.)	53%	$40,000
Design School (master's)	62%	$27,000
Dental School (D.M.D.)	88%	$88,000
Divinity School (master's)	74%	$18,000
Education School (Ed.D.)	51%	$24,000
Kennedy School of Government (master's)	92%	$18,000
Law School (J.D.)	68%	$57,000
Medical School (M.D.)	70%	$52,000
School of Public Health (master's)	70%	$33,000

These are sizable sums, and for most people, paying them back is far from easy. In many of the professions, compensation tends to be modest—at least at the beginning of one's career, and sometimes throughout it. Moreover, elevated debt levels can seriously affect career choices, leading graduates to opt for high-paying opportunities in preference to more service-oriented ones. Mindful of this problem, the Law School pioneered a Low Income Protection Plan that reduces the debt burden of students who pursue public service careers. Similar options are in place or under consideration elsewhere. Yet the costs of these programs are great, and funding them is a major challenge.

Besides borrowing, many students work long hours at various jobs to help make ends meet. The educational impact can sometimes be serious: there is less time to study, and (for Ph.D. students especially) the time to earn a degree can be considerably lengthened, compounding the student's financial dilemma in the long run. It can be a wearying process for many; and for some, the financial hardships can eventually lead to withdrawal from a program of study.

Harvard's record of student assistance is a very strong one. This year, for instance, the university will provide graduate and professional school students with more than $40 million in fellowship grants. But as the loan statistics show, even this amount of aid is less than what is required. Several of our Schools are underendowed; and because their graduates are not in high-compensation

fields, annual giving by alumni can go only so far. This problem is felt with particular urgency in Design, Divinity, Education, and Public Health; similar but somewhat different problems affect students in our remaining professional schools. In Arts and Sciences, by contrast, a significantly larger share of financial aid is provided in the form of outright grants. This goes a considerable way toward moderating the debt burden of graduate students, but not without an equally considerable expense: more than $20 million in Arts and Sciences funds during the past academic year alone.

Financial aid for graduate and professional school students has attracted too little notice for too long. If we are to keep our doors open—as we must—to advanced students in all fields, we will need to find more effective ways to support them than has been the case in the past quarter-century.

3. FACULTY AND STAFF DIVERSITY

HARVARD REMAINS FULLY COMMITTED to seeking and hiring excellent faculty and staff, throughout the university, from underrepresented groups in our society. For the past two decades or so, this effort has been steady and extremely important. The gains have been real, both for women and for members of different minority groups, although progress has been uneven. Increased efforts in the years ahead will lead to more progress. But the time has also come for a more complex and developmental approach to the issue of faculty and staff diversity. We need a better and clearer analysis of the objective problems to be overcome, and an equally clear sense of the kinds of initiatives that can help us make effective future gains. Such initiatives are now taking shape, and must be strengthened.

The situation is particularly complicated with respect to faculty, partly because the number of openings in any given year tends to be relatively small. This is especially true in the tenured ranks, where professors remain on the faculty for extended periods of time—many of them for thirty years or longer. In addition, we are in an era of economic constraint, and the overall size of the faculty will increase only marginally. Moreover, with the imminent

elimination of a stipulated mandatory retirement age, the rate of turnover in the tenured faculty may well become even slower than before. What do these factors mean in more specific terms? In recent years, most of Harvard's professional schools have tended to appoint only one to five new tenured professors in a given year—often closer to one than to five. Within the Faculty of Arts and Sciences, the number has been closer to twenty a year—but even there, the opportunities for change are constrained, depending upon which departments or fields have positions available.

There is another important factor that affects the effort to diversify: the number of individuals from different underrepresented groups who are choosing to enter academic life (as compared to other professions) and the specific fields they are entering. In this regard, we can take much encouragement from the increasing proportion of women among the U.S. citizens receiving Ph.D.'s in arts and sciences. As of 1990, the figure was approximately 40 percent; only a decade before, it was measurably less. As these recent Ph.D.'s approach the tenure-promotion point during the next several years, we can expect the composition of our senior faculty ranks to begin to reflect, over time, the greater proportion of women entering the profession—especially if the distribution of women Ph.D.'s continues to widen across different academic fields (including math, the physical and applied sciences, and certain social sciences such as economics). Moreover, our goal—if possible—is to "beat the averages" through more intensive recruiting, even though the competition is at the moment exceptionally strong.

Given these circumstances, we are in a good position to do well in the years ahead. We need to recognize, however, that even excellent performance must still be viewed in the context of an Arts and Sciences faculty that includes more than 600 assistant, associate, and full professors, roughly two-thirds of whom are tenured. With only about 20 tenured appointments per year, and with only some proportion of those 20 going to women, the overall rate of change in the composition of the Arts and Sciences tenured ranks will inevitably be "bounded" by these basic realities.

For members of minority groups, the Ph.D. numbers present a different picture. In 1990, for example, roughly 15,000 Ph.D.'s

were conferred on U.S. citizens nationwide in all arts and sciences fields. Of those, 328 went to African-Americans (slightly more than 2 percent); 457 to Hispanic-Americans (slightly more than 3 percent); 373 to Asian-Americans (slightly less than 2.5 percent); and 44 to Native Americans (roughly 0.3 percent). In other words, these four groups together accounted for fewer than one in ten of the arts and sciences Ph.D.'s conferred. Since there are more than 3,000 colleges and universities in the United States, there is intense competition for these potential faculty members—at all levels of the faculty ranks. If we again consider that the Faculty of Arts and Sciences tends to make about 20 tenured appointments a year, we would need to "beat the averages" considerably just to make tenured appointments of one individual from each of the identified groups in a given year. The outlook is further complicated by the fact that many of the Ph.D.'s tend to be clustered in a limited number of fields. For instance, 107 of the 328 arts and sciences Ph.D.'s received by African-Americans in 1990 were in the single discipline of psychology—leaving only 221 in all other arts and sciences fields. This is a dramatic example of why the distribution among fields—and not just the aggregate number of Ph.D.'s awarded—is such a critical factor in assessing the overall outlook.

The situation, of course, varies not only from field to field within the arts and sciences, but also from profession to profession; and the preceding data represent only part of the whole picture. Still, the "pool" or "pipeline" problems facing most of the professional schools are also substantial, and we must recognize and address those problems as we move forward to diversify our faculty ranks throughout the university. Fortunately, as we look ahead, there are a number of positive steps that can be taken—at a national level, as well as at the level of individual institutions. Some are already under way, if only in an early stage of development. They include:

- Learning much more about the career choices of our college graduates—especially women and members of minority groups. We need to have more than just impressionistic, anecdotal information in seeking to understand why more of our students do not enter the academic profession, and why many of those who do tend to focus on a relatively restricted number of fields.

- Pursuing ways to encourage talented students to think sooner and more seriously about careers in academia. Many young people grow up with at least a rough idea of what it means to be a doctor or a lawyer or a business person. But very few students understand what it means to spend one's life as a professor—and why such a life can be so satisfying. Moreover, if students do not begin to think seriously about academia until late in their junior or even senior year of college, it can often be too late to undertake the concentrated study in a particular field that Ph.D. programs expect from their applicants. Better information and advising—at a much earlier stage—can at least help young people to understand the rewards and opportunities of a college or university career.

- Supporting and helping to evaluate special programs that aim to engage greater numbers of women and minority undergraduates in academic "apprenticeships" with faculty members. Students with at least a potential interest in academic careers need to be encouraged—through direct and supportive contact with faculty—to test the waters and, if all goes well, to take the plunge. Similar developmental programs are extremely important in the professional schools.

- Providing adequate financial aid at the graduate level for students who wish to pursue academic careers, but for whom the financial obstacles loom forbiddingly large.

Harvard is already engaged—with the help of some foundations and other organizations—in a number of projects along these lines. They include—among others—the Mellon Foundation program for undergraduate research, the Minority Faculty Development Program at the Medical School, the Charles Hamilton Houston Fellowship Program at the Law School, and the Minority Post-Doctoral Fellowship Program at the School of Public Health. Harvard has also been working with the other members of the Ivy League to do a systematic analysis of many of the issues enumerated above.

All of these efforts focus ultimately on one fundamental issue: how can we support and encourage students who have the potential interest and special ability to enter academic careers? This

encouragement and support must, of course, start much earlier than college, so that a greater number of students are better prepared at every stage in their education. Here, our colleges and universities can help by becoming more involved in pre-college education, in some of the ways described earlier in this report. Our success—as a nation—in addressing the social, economic, and educational issues that underlie the "pipeline" problem at all levels will profoundly affect not only our effort to diversify our faculties, but our larger effort to build a healthy, productive, and equitable society.

Meanwhile, there are other actions we can and will continue to take—including vigorous outreach in our searches, intelligent use of joint appointments, targeted attempts to alleviate the financial obstacles faced by certain departments where women and members of minority groups remain underrepresented, and concerted efforts to make Harvard a welcoming environment for present and prospective faculty members from all backgrounds.

As part of this enterprise, we should seek to leverage our success in certain areas so that we can achieve greater diversity in others. For example, fields such as women's studies and African-American studies are being developed at Harvard in ways that build in large measure on joint appointments with other departments or even other Schools. Recently, for instance, the Afro-American Studies Department worked together with the Divinity School on the appointment of a leading scholar and teacher in the field of African-American religious traditions. This represents one promising model (though not the only one) for addressing academic needs related to the history and traditions of other racial and ethnic groups—fields which are receiving thoughtful and more systematic consideration within Arts and Sciences and beyond. Such joint appointments not only create new opportunities for talented scholars, but also foster closer connections across disciplinary lines.

In these and other ways, Harvard's goal is to strengthen the fabric of the diverse community that is already here, but that is also in the process of being continually re-created. Although I have focused here largely on faculty, it is also essential to sustain our momentum in building the diversity of our staff. This will mean

continuing our broad-based efforts to identify and recruit talented individuals from underrepresented groups in all job categories.

We will be carrying forward with these efforts at a time when ethnic and other tensions continue to beleaguer societies throughout the world. It is also a time when many people often view excellence and diversity as competitive rather than complementary ideals. To achieve our goals, therefore, will not be easy, and the going will not always be smooth.

But it should be clear by now that any other way is ultimately self-defeating. In our own century, we have witnessed the oppression and even the obliteration of millions of people because others regarded them as undesirable, inferior, or simply different. Given this history, with its harvest of bitterness and ashes, surely we must be ready for a vision that is not only more generous and tolerant, but also more prescient. We must see, by now, that excellence knows no boundaries, is not constrained by region or religion or race or gender, will not be tamed or extinguished. What other way is open, therefore, but to seek it and nourish it in all its forms?

Part VI. Conclusion

> The child born in 1900 would, then, be born into a new world which would not be a unity but a multiple. Adams tried to imagine it, and an education that would fit it. He found himself in a land where no one had ever penetrated before.
>
> Henry Adams
> *The Education of Henry Adams*
> (1907)

THIS REPORT BEGAN with a passage from Cardinal Newman that described all knowledge as unified and interconnected: a system in which "every thing in some sort" would "lead to every thing else," communicating "the image of the whole to every separate portion."

A half century later, Henry Adams—following in the wake of Darwin and Marx, as well as the massive changes in society created by advances in science and technology—saw knowledge and the world not as a unity, but as a multiple: a multiple so great in its complexity that Adams could not imagine an education equal to the task of "fitting" it.

We ourselves have inherited both visions: that of Newman, and of Adams. The effort to discover and create unity—in knowledge and understanding, no less than in life—is one that we cannot relinquish. But our consciousness of multiplicity and fragmentation is no less real or compelling.

This report has tried to take into account the often battling complexity that pervades our world and so many of our institutions. It has also tried to suggest ways that we can increase the sense of unity and coherence among Harvard's programs, and within the university as a whole. The challenge now is to conceive of an education, however imperfect, that will "fit" the child born not in 1900, but in the year 2000.

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There is obviously no single or definitive response to this challenge. But in bringing this report to a close, let me highlight once more some of its major themes.

At the risk of oversimplification, it may be helpful to recall the important goals mentioned in the opening pages of this document: excellence, openness, service. These goals are interrelated, and it is impossible to imagine how we could approach the fulfillment of any one of them without recognizing the extent of its deep dependence on the others.

In addition, there are other notes to be sounded one last time:

- To bring the university's different parts closer together, so that we can live and act more effectively as a single institution. Sustaining the strength of every individual School and unit remains essential; but our ability to achieve this goal will depend, more and more, on our ability to reinforce the strength of Harvard as a whole.

- To redesign many of our first-degree and advanced educational programs, especially but not only in professional education. A central purpose here is to strengthen the links among research, teaching, learning, and practice. As our world and the major professions continue to change in fundamental ways, so too must education change.

- To invest substantially in the teaching mission of undergraduate education in the arts and sciences, and indeed in the programs of all our Schools. Nearly every Faculty or School plans to place substantial emphasis on the development of teaching methods that stimulate active inquiry and expand the opportunities for advanced independent work on the part of students: more small-scale discussion groups or seminars; a greater use of challenging case studies; more effective uses of information technology; and more possibilities for internships and fieldwork.

- To increase our understanding of—and our ability to help address—pressing problems that now confront our own society, as well as many others. These include (among others) the difficulties faced by public school systems; problems related to health care; threats to the environment; the state of the world's

economy and its political institutions; and the need to further international understanding in the cause of peace.

- To sustain Harvard as a strong human as well as academic institution: residential, open, diverse, and committed to creating a community in which individuals and groups learn from one another outside the classroom as well as inside. Maintaining our strong financial-aid programs is one critical part of this effort: keeping Harvard's doors open, and ensuring that we remain affordable to students of talent from all income groups and all backgrounds, will continue to be a major university priority. Sustaining close and fruitful relations with our neighboring communities—Cambridge, Boston, and beyond—represents another important goal.

- To continue our drive to achieve better management of the resources we already possess. This includes the need to seek economies, to make selective reductions, and to consolidate programs or activities when appropriate.

Above all, we will remain a university in the full sense of the word: international as well as national in scope; seeking truth in all its forms and formulations; sustaining the study and interpretation of existing knowledge, while also searching for new insights to help us understand nature and human nature; and guiding students to lead inquiring lives and to become effective leaders.

The end of study is greater knowledge and understanding; but the end of education is significant action. In stressing education for leadership in the years ahead, Harvard hopes that its students will combine understanding and action in ways that will benefit individuals and society alike. In all of our planning, we have tried to take into full account not simply how we may be able to strengthen Harvard, but how the university can in turn use its own strength in the service of others.

When all of these activities are carried forward with energy and zest, with persistence and care, and with a sense of common purpose, then—and only then—does the university truly flourish. To ensure that it continues to do so is the task we face together.

It is my sad duty to conclude this report by acknowledging a number of individuals from among the ranks of the University who died during the calendar years 1991 and 1992. They include two former members of the Board of Overseers: William Appleton Coolidge, Overseer from 1967 to 1973, who died on May 24, 1992, at the age of 90; and Thomas Hopkinson Eliot, Overseer from 1964 to 1970, who died on October 14, 1991, at the age of 84. Harvard was honored by the distinguished service of these two former Overseers, and by that of the men and women named in the pages that follow.

Necrology

Milton Harold Alper, Professor of Anaesthesia, died on September 13, 1991, at the age of 61. Born in Lynn, Massachusetts, he graduated from Harvard College in 1950 and Harvard Medical School in 1954. After serving as an Air Force surgeon in Japan, Dr. Alper returned to Boston to complete a residency in anaesthesia at the Peter Bent Brigham Hospital, now the Brigham and Women's Hospital. He was a staff anaesthesiologist at the Brigham before being named chief of the service at the former Boston Hospital for Women. He went on to serve as chief of anaesthesiology at Children's Hospital Medical Center for more than a decade. His Harvard faculty appointments included Assistant Clinical Professor of Anaesthesia (1967), Associate Professor of Anaesthesia (1969), and Professor of Anaesthesia (1980). He was the author or coauthor of numerous publications dealing with the pharmacology of anaesthetic drugs and anaesthesia for obstetrics.

George Eugene Bates, James R. Williston Professor of Investment Management, *Emeritus*, died on September 25, 1992, at the age of 90. Educated at the University of Missouri (B.A., 1923; M.A., 1924) and Harvard (M.B.A., 1925), Professor Bates became an Assistant Dean of the Harvard Business School in 1925. He became Professor of Finance in 1939, Professor of Business Administration in 1942, and the James R. Williston Professor of Investment Management in 1954, a position he held until assuming *emeritus* status in 1965. He served as an editor of the *Harvard Business School Alumni Bulletin* and of the *Harvard Business Review*. He also served as a senior advisor to the Business Administration Institute of the University of Istanbul in Turkey, and as an advisor on administrative training to the Tunisian government. During World War II, he was director of instruction at the U.S. Naval Supply Corps Midshipmen School. Professor Bates was an honorary curator of Byzantine coins and seals at the Fogg Art Museum, a member of the Harvard-Cornell archaeological exploration of Sardis, Turkey, a fellow of the American Numismatic Society, and an honorary trustee of the New England Historic Genealogical Society.

Francis Birch, Sturgis Hooper Professor of Geology, *Emeritus*, died on January 30, 1992, at the age of 88. Born in Washington, D.C., Professor Birch graduated from Harvard College in 1924, and received a doctorate in physics from Harvard in 1931. He was appointed Assistant Professor of Geophysics in 1937, Professor of Geology in 1946, and Sturgis Hooper Professor of Geology in 1949. He assumed *emeritus* status in 1974. During World War II, he served at the Radiation Laboratory at the Massachusetts Institute of Technology, and as a Navy officer at

Los Alamos, New Mexico. He served on the Board of Syndics of the Harvard University Press, and as president of the Geological Society of America. He was awarded the Geological Society's Day and Penrose medals, as well as the Geophysical Union's Bowie Medal and the Royal Astronomical Society's Gold Medal.

Edward Franklin Bland, Clinical Professor of Medicine, *Emeritus*, died on September 27, 1992, at the age of 91. Dr. Bland was born in West Point, Virginia. He received his B.A. in 1923 and his M.D. in 1927, both from the University of Virginia. After coming to Boston for his internship in medicine and his residency in cardiology at the Massachusetts General Hospital, he spent a year at University College Hospital, London, then returned to Boston in 1931 to work at a rheumatic fever hospital, the House of the Good Samaritan. He joined the MGH staff, and became a research fellow at Harvard Medical School, where he was named Instructor in Medicine in 1934, Assistant Clinical Professor of Medicine in 1943, and Clinical Professor of Medicine in 1965. During World War II, Dr. Bland served with the Army's Sixth General Hospital in the Mediterranean theatre, and was awarded the Bronze Star. He wrote the section on heart disease in the official history of medicine in World War II. A leading authority on rheumatic fever and endocarditis, he was given the Paul Dudley White Award of the Massachusetts affiliate of the American Heart Association in 1975. Until a few months before he died, Dr. Bland continued to attend cardiology rounds at MGH, where in 1987 he had been awarded his 60-year service pin.

Dwight LeMerton Bolinger, Professor of Romance Languages and Literatures, *Emeritus*, died on February 23, 1992, at the age of 84. Born in Topeka, Kansas, Professor Bolinger graduated from Washburn College in 1930. He received his M.A. from the University of Kansas in 1932, and his Ph.D. from the University of Wisconsin in 1936. An English linguistics expert and scholar of the Spanish language, Professor Bolinger taught at the University of Wisconsin, Colegio de San Luis in Cartago, Costa Rica, Washburn, the University of Southern California, and the University of Colorado. He was Professor of Romance Languages and Literatures at Harvard from 1963 to 1974. His honors included the Orwell Award of the National Council of Teachers of English. Beginning in 1978, he was a visiting professor at Stanford University. He served as president of the Linguistic Society of America, the Linguistic Association of Canada and the United States, and the American Association of Teachers of Spanish and Portuguese. The author of 15 books, including *Forms of English* and *Aspects of Language*, he also wrote more than 300 journal articles, mostly on linguistics and Spanish. At the time of his death, he was joint chairman of the honorary editorial advisory board of *The Encyclopedia of Language and Linguistics*.

Nina Starr Braunwald, Associate Professor of Surgery, died on August 5, 1992, at the age of 64. Dr. Braunwald received her B.A. from the Washington Square College of Arts and Sciences, New York University, in 1949, her M.D. from New

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York University College of Medicine in 1952; and her M.S.S. from Georgetown University in 1957. In 1965 she was appointed deputy chief of the Clinic of Surgery at the National Heart Institute. She joined the Harvard faculty as Associate Professor of Surgery at the Peter Bent Brigham Hospital in 1972. She served as a member of the cardiac surgical staff at the Brigham, at Children's Hospital, and at West Roxbury Veterans Administration Hospital. An authority on the production of nonthrombogenic surfaces by the use of tissue culture techniques, she was the first woman certified by the Board of Thoracic Surgery and the first woman member of the American Association of Thoracic Surgery.

Benjamin Gene Covino, Professor of Anaesthesia, died on April 4, 1991, at the age of 60. Born in Lawrence, Massachusetts, he received his A.B. from Holy Cross in 1951, his Ph.D. from Boston University in 1955, and his M.D. from the University of Buffalo School of Medicine in 1962. Dr. Covino began his service to Harvard Medical School in 1978 as Lecturer on Anaesthesia and was appointed Professor of Anaesthesia in 1979. He served as editor-in-chief of the journal *Regional Anesthesia* and as president of the American Society of Anaesthesiology. His numerous honors included the Labatt Award of the American Society of Regional Anesthesia. His published works included *Local Anesthetics* and *Handbook of Epidural Anaesthesia and Analgesia*.

Gustave John Dammin, Elsie T. Friedman Professor of Pathology, *Emeritus*, died on October 11, 1991, at the age of 80. He received his bachelor's degree from Cornell in 1934 and his M.D. from Cornell Medical College in 1938. He was awarded the Legion of Merit for his distinguished medical service during World War II. He served as Assistant Professor and then Professor at Washington University, St. Louis, from 1946 to 1952. His service to Harvard began in 1952, when he became Professor of Pathology at the Peter Bent Brigham Hospital. In 1961 he was appointed Elsie T. Friedman Professor of Pathology, a position that he held until taking *emeritus* status in 1978, when he moved to the School of Public Health to become a lecturer in the Department of Tropical Public Health. He was the author or coauthor of more than 200 publications, including works on the human pathology of renal transplantation and immunosuppressive therapy, the pathology of enteric infections, and infections transmitted by ticks endemic to New England. The Gustave J. Dammin Lectureship was endowed by the Brigham and Women's Hospital Department of Pathology in 1979.

Karl Wolfgang Deutsch, Stanfield Professor of International Peace, *Emeritus*, died on November 1, 1992, at the age of 80. Born in Prague, he received a degree from the Deutsche Universitaet in Prague in 1934 and a law degree from Charles University in Prague in 1938. He then came to the United States. He worked for the Office of Strategic Services during World War II, and took part in the 1945 San Francisco conference that resulted in the founding of the United Nations. He taught at the Massachusetts Institute of Technology from 1945 to 1956, and received his Ph.D. from Harvard in 1951. His thesis was given the Summer Prize. After ser-

vice at Yale, he returned to Harvard in 1967 to become Professor of Government and a member of the Faculty of Public Administration. He was appointed Stanfield Professor of International Peace in 1971, and assumed *emeritus* status in 1983. He was a leading authority on the application of quantitative methods in social science research. From 1985 to 1989 he was a presidential fellow at the Carter Center and visiting professor at Emory University in Atlanta. He was the author of many scholarly works, including *Nationalism and Social Communication*, *The Analysis of International Relations*, and *Tides Among Nations*. A collection of essays, *From National Development to Global Community*, was published in his honor in 1981.

Cora Du Bois, Samuel Zemurray, Jr. and Doris Zemurray Stone Radcliffe Professor of Anthropology, *Emerita*, and Honorary Curator of South Asian Ethnology, died on April 7, 1991, at the age of 87. She received her bachelor's degree from Barnard College in 1925, her master's from Columbia in 1928, and her Ph.D. from the University of California in 1932. She became Samuel Zemurray, Jr. and Doris Zemurray Stone Radcliffe Professor of Anthropology in 1954 and assumed the additional position of Curator of South Asian Ethnology in 1968, before taking *emerita* status in 1969. A pioneer in the field of psychological anthropology and an authority on Southeast Asia, she published numerous works including *The People of Alor: A Social-Psychological Study of an East Indian Island* and *Social Forces in Southeast Asia*. During World War II, she served in the Office of Strategic Services as chief of the Indonesia section of the Research and Analysis Branch. After the war, she spent five years directing Southeast Asian research for the State Department. After retiring from Harvard in 1969, she was Professor at Large at Cornell University from 1971 to 1976. She served as president of the American Anthropological Association and the Association of Asian Studies.

James Morse Dunning, Professor of Ecological Dentistry, *Emeritus*, and former Dean of the Harvard School of Dental Medicine, died on June 20, 1991, at the age of 86. Born in New York City, Dr. Dunning graduated from Harvard College in 1926, and from the Columbia School of Dental and Oral Surgery in 1930. After practicing in coastal Labrador, and serving in the Navy Dental Corps during World War II, he received a master's degree in public health from Harvard in 1947. Dean of the School of Dental Medicine from 1947 to 1952, he led curricular reform efforts, secured accreditation for the School from the American Dental Association, and promoted school-based health programs. His efforts in public health led to the establishment of the Martha Eliot Health Center in the Bromley Heath housing development in Jamaica Plain. Dr. Dunning served as Director of the University Dental Health Service from 1955 to 1965, the year in which he assumed the title Professor of Ecological Dentistry. He assumed *emeritus* status in 1972, and in 1976 was called back to serve for two years as Acting Director of Ecological Dentistry. An influential proponent of fluoridation, he was the second recipient of the John W. Knutson Award, named for the dentist who first showed that fluoride prevents tooth decay. His publications included *Principles of Dental Public Health* (1962) and *Dental Care for Everyone* (1976).

WILBUR BIRCH ENGLAND, Sebastian S. Kresge Professor of Marketing, *Emeritus*, died on February 22, 1991, at the age of 87. He received his bachelor's degree from Case Western Reserve University in 1926, and his M.B.A. from Harvard in 1930. He spent twenty years in business, becoming a prominent figure in the field of industrial purchasing. In 1952 he was appointed Lecturer on Business Administration at Harvard Business School. He became Professor of Business Administration in 1954 and Sebastian S. Kresge Professor of Marketing in 1963, then assumed *emeritus* status in 1970. He continued to teach for many years, not only in the United States, but also in India, Argentina, Canada, and Great Britain. His published works included *Procurement: Principles and Cases* and *Purchasing and Materials Management*.

JOHN KING FAIRBANK, Francis Lee Higginson Professor of History, *Emeritus*, and former Director of the East Asian Research Center, died on September 14, 1991, at the age of 84. Born in Huron, South Dakota, he attended the University of Wisconsin for two years before transferring to Harvard, where in 1929 he received his A.B. degree. A Rhodes scholar at Oxford University, he received a B.Litt. in 1933, and a doctorate in 1936. He then returned to Harvard as Instructor in History and Tutor in the Division of History, Government and Economics. In 1948 he became Professor of History, and in 1959 was appointed the Francis Lee Higginson Professor of History. In 1955, he founded the East Asian Research Center, now known as the John King Fairbank Center for East Asian Research, and he served as its director until 1973. As director, he nurtured the Center's growth into an internationally renowned institute for Asia scholars. He continued as Francis Lee Higginson Professor of History and as chairman of the Council on East Asian Studies until 1977, when he assumed *emeritus* status. During World War II, Professor Fairbank served as special assistant to the American ambassador in Chungking, and later as director of the United States Information Service in China. His many published works included *The United States and China* and *China: Land and the Next Century*. He received numerous honorary degrees, including an LL.D. from Harvard in 1970, and was awarded the Harvard Medal by the Harvard Alumni Association in 1986. He served as president of the American Historical Society and of the Association of Asian Studies, as vice president of the Far Eastern Association, and as a member of the Council on Foreign Relations.

MYRON BERNARD FIERING, Gordon McKay Professor of Engineering and Applied Mathematics, died on October 28, 1992, at the age of 58. Born in New York City, Professor Fiering graduated with an A.B. from Harvard in 1955, and a Ph.D. from Harvard in 1960. A leading authority on water flow management and water systems design, he was appointed Gordon McKay Professor of Engineering and Applied Mathematics in 1969. His published works included *Streamflow Synthesis* and *Operations Research, Uncertainty and Medical Care*. He was awarded a gold medal by the Inter-American Association of Sanitary Engineers in 1958, and received the Clemens Herschel Award for Excellence in Hydraulics in the same year. He served on the Admissions Committee for the College and also chaired the Standing Committee on Athletic Sports.

ANNE PAPPENHEIMER FORBES, Clinical Professor of Medicine, *Emerita*, died on February 25, 1992, at the age of 80. Born in New York City, she graduated from Radcliffe College in 1932, and received her M.D. from Columbia in 1936. After an internship at Johns Hopkins Hospital in Baltimore, she joined Harvard Medical School as a Research Fellow in Pharmacotherapy. She also joined the endocrine unit of Massachusetts General Hospital, as an associate of Dr. Fuller Albright. The Forbes-Albright syndrome, a disease of the pituitary gland, bears their names. Dr. Forbes was instrumental in creating the Ovarian Dysfunction Clinic at MGH, and promoted the study of endocrinology as an integral part of the study of internal medicine. In 1953 she was appointed Instructor in Medicine at Harvard Medical School. She rose in rank over the years, becoming Clinical Professor of Medicine in 1977. She was a member of the American Society for Clinical Investigation and the Royal Society of Medicine in London. On leave from Harvard Medical School, she was Assistant Professor of Medicine at Pahlavi University Medical School in Iran from 1967 to 1969.

ALFRED LEO FRECHETTE, Clinical Professor of Public Health Practice in the School of Public Health, died on April 7, 1991, at the age of 81. Dr. Frechette received his medical degree in 1934 from the University of Vermont, and his Master of Public Health from Harvard in 1939. His service to Harvard began with his appointment in 1946 as Assistant in Epidemiology, and continued through appointments as Instructor in Public Health Practice, Assistant Professor of Public Health Practice, and Clinical Professor of Public Health Practice.

PAUL ABRAHAM FREUND, Carl M. Loeb University Professor, *Emeritus*, died on February 5, 1992, at the age of 85. Born in St. Louis, Missouri, he received a bachelor's degree from Washington University in 1928, an LL.B. from Harvard Law School in 1931, and an S.J.D. from Harvard in 1932. He served as law clerk to Justice Louis D. Brandeis in 1932–33. From 1933 to 1939 he worked at the Treasury Department, the Reconstruction Finance Corporation, and the Office of the Solicitor General. He joined Harvard Law School as Lecturer on Law in 1939, and became Professor of Law in 1940. After further service in the Solicitor General's office, he returned to Harvard as Professor of Law, then became Charles Stebbins Fairchild Professor of Law in 1950, Royall Professor of Law in 1957, and Carl M. Loeb University Professor in 1958. He assumed *emeritus* status in 1976. One of the foremost constitutional scholars of his time, Professor Freund was the author of *On Understanding the Supreme Court* (1949), *The Supreme Court of the United States* (1961), and *On Law and Justice* (1968), among other publications. He served as president of the American Academy of Arts and Sciences, chair of the Federal Judicial Center's Study Group on the Caseload of the Supreme Court, chair of the Judicial Selection Commission for the U.S. Court of Appeals for the First Circuit, and vice president of the Massachusetts Historical Society. His awards included the Research Award of the American Bar Foundation (1973), the Torch of Learning Award of the American Friends of Hebrew University (1974), the Roger Baldwin Award of the Civil Liberties Union of Massachusetts (1982), the

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Justice Award of the American Judicature Society (1983), the Harvard Medal (1986), and the Henry J. Friendly Award of the American Law Institute (1989).

HARRY LOUIS HANSEN, Malcolm P. McNair Professor of Marketing, *Emeritus*, died on August 3, 1992, at the age of 80. Born in New York City, he received his bachelor's degree from Haverford College in 1933, his M.B.A. from Harvard in 1935, and his D.C.S. from Harvard in 1939. That same year he was appointed Assistant Professor and Assistant Dean at the Business School. During World War II, he taught at the U.S. Army Air Forces Statistical School and was a consultant to the commanding general of the Army Air Forces. He became an Associate Professor after the war, was appointed Professor in 1949, and in 1965 became the first Malcolm P. McNair Professor of Marketing. He was an early leader of the Business School's international programs, and his honors included the Presidential Order of Merit from the Philippines for his contributions to management development in Asia, and the Benjamin Franklin Gold Medal from the British Royal Society of Arts for his contributions to management education in Britain. Also in recognition of his work in Britain, a Hansen Research Fellowship in Anglo-American Management was established at the Judge Institute of Management Studies, Cambridge University. His publications included *Problems in Marketing*, *Readings in Marketing*, and *British Managers in the Making*.

DAVID HURWITZ, Clinical Professor of Medicine, *Emeritus*, died on February 22, 1992, at the age of 86. Born in Boston, Dr. Hurwitz was a graduate of Harvard College (S.B., 1925) and Harvard Medical School (M.D., 1929). He interned at Boston City Hospital and served his residency at the University of Chicago Clinics. He served at Harvard Medical School beginning in 1931, and became Clinical Professor of Medicine in 1967. During the 1950s and 1960s, he served as both chief of medical services at Mount Auburn Hospital and chief of the Diabetes Clinic at Boston City Hospital, which became a prototype for similar clinics at county and municipal hospitals across the country. A leading authority on hypoglycemic agents, Dr. Hurwitz was Mount Auburn's first director of medical education, and in 1984 the hospital's auditorium was named in his honor. His career also included service as president of the staff of Boston City Hospital and as president of the New England Diabetes Association.

FRANCIS MCCALL INGERSOLL, Clinical Professor of Gynecology, *Emeritus*, died on January 15, 1991, at the age of 78. A native of Tecumseh, Nebraska, he graduated from Hastings College in 1934 and from Harvard Medical School in 1938. He served an internship and residency at Massachusetts General Hospital before joining the staff in 1942, and was a gynecologist and surgeon at MGH for more than four decades until his retirement in 1984. He began his service at the Medical School in 1944, and was appointed Clinical Professor of Gynecology in 1970. In 1949, he helped introduce a postgraduate course in gynecology at the Medical School. Dr. Ingersoll served as president of the American Fertility Society and of the New England Surgical Society.

James Tuttis Irving, Professor of Physiology at the Forsyth Dental Center for Children, *Emeritus*, died on April 14, 1992, at the age of 89. Dr. Irving, of Christchurch, New Zealand, received the A.B. (1923), Ph.D. (1927), and M.D. (1931) from Cambridge University. He was Professor of Physiology at the University of Capetown from 1940 to 1953. He then accepted a post as Professor of Experimental Odontology and Director of the Dental Research Unit, controlled jointly by the Council for Scientific and Industrial Research and the University of Witwatersrand in Johannesburg. He became Professor of Anatomy in the School of Dental Medicine in 1958 and Professor of Physiology at the Forsyth Dental Center for Children in 1960. He assumed *emeritus* status in 1968, but later returned to service, including several years as Visiting Lecturer on Oral Biology. He was noted for his work in the areas of mineral metabolism, calcification, and tooth formation.

Herman Moritz Kalckar, Professor of Biological Chemistry, *Emeritus*, died on May 15, 1991, at the age of 83. Born in Copenhagen, Denmark, Dr. Kalckar received his M.D. in 1933 and his Ph.D. in 1936, both from the University of Copenhagen. He then came to the United States as a Rockefeller Fellow at the California Institute of Technology, his career took him as well to the Washington University School of Medicine, the Public Health Research Institute of New York City, the National Institutes of Health, the University of Copenhagen, and Boston University. After serving at Johns Hopkins University, he came to Harvard in 1961 as Professor of Biological Chemistry. He was a pioneer in the study of intermediary metabolism, and was also instrumental in identifying the cause and treatment of galactosemia, a genetic disease involving milk sugar intolerance. Dr. Kalckar was a member of the National Academy of Sciences and the Royal Danish Academy, and a fellow of the American Academy of Arts and Sciences. A volume entitled *The Cell Membrane* was published in his honor in 1984.

Edmund Philip Learned, Charles Edward Wilson Professor of Business Policy, *Emeritus*, died on July 29, 1991, at the age of 90. Born in Kansas, he received a B.A. in 1922 and an M.A. in 1925 from the University of Kansas, and an M.B.A. in 1927 and a D.C.S. in 1940 from Harvard. In 1927 he began his service at the Business School as Instructor in Marketing. He became Professor of Marketing in 1939, Professor of Business Administration in 1945, and the first Charles Edward Wilson Professor of Business Policy in 1960. Over the years he taught in eight different subject areas of the Business School and headed six of them. He was a pioneer in the use of statistics in management and an expert in the areas of business policy and top-level management practices. He was the author or coauthor of numerous publications, including *Business Policy: Texts and Cases* and *Executive Action*. During World War II, he was the first director of training of the U.S. Army Air Forces Statistical Control School at Soldiers Field. In 1967, on the eve of his retirement, a group of former AAF officers announced the endowment of a professorship in his name and that of Robert Lovett, former Assistant Secretary of War, who authorized the creation of the Statistical Control School at Harvard.

Perry London, Professor of Education, died on June 19, 1992, at the age of 61. A native Nebraskan, he received a B.A. from Yeshiva College in 1951, an M.A. in 1953, and a Ph.D. in 1956 from Teachers College, Columbia University. Following his years of residence in Israel, where he taught psychology at Tel Aviv University and the Hebrew University of Jerusalem School of Education, he came to Harvard in 1984 as Visiting Professor of Education, and became Professor of Education the following year. An authority on the psychology of character development, the technology of helping interventions, and the origins of achievement motivation, he was the author of *The Modes and Morals of Psychotherapy*, as well as *Behavior Control* and *Beginning Psychology*.

Albert Bates Lord, Arthur Kingsley Porter Professor of Slavic and Comparative Literature, *Emeritus*, died on July 24, 1991, at the age of 78. Professor Lord graduated from Harvard with an A.B. in 1934, an A.M. in 1936, and a Ph.D. in 1949. He became Associate Professor of Slavic Languages and Literatures in 1942, Professor of Slavic and of Comparative Literature in 1948, and Arthur Kingsley Porter Professor of Slavic and Comparative Literature in 1971. A pioneering scholar of folklore and mythology and of the oral tradition, he for many years taught the popular lecture course "Hum 9: Oral and Early Literature." His books included *Serbo-Croatian Folk Songs* (with Bela Bartok, 1951), *The Singer of Tales* (1960), and *A Bulgarian Literary Reader* (1968, co-editor). He was honorary curator of the Milman Parry Collection of Oral Literature in Widener Library from 1949 until his death. In 1988, he received the Yugoslav Star for his work on Serbo-Croatian oral literature. That same year, he was honored by the American Folklore Society, which presented him with a trunk full of oral epics from around the world.

Alexander Marble, Clinical Professor of Medicine, *Emeritus*, died on September 23, 1992, at the age of 86. Born in Troy, Kansas, he received his B.A. in 1922 and M.A. in 1923 from the University of Kansas. He graduated from Harvard Medical School in 1927 and became a Teaching Fellow in Medicine the following year. During his four decades of service, he rose through the ranks to become Clinical Professor of Medicine in 1966. An expert on diabetes, Dr. Marble helped to develop the Joslin Diabetes Center in Boston, and was its president from 1967 to 1979. He was principal editor of the two most recent editions of the Joslin textbook on diabetes, first published in 1916. Dr. Marble was a president of the American Diabetes Association, honorary president of the International Diabetes Federation, and the recipient of numerous honors for his efforts in diabetes care.

John Robert Marchant, Secretary of the Faculty of Arts and Sciences, Assistant Dean of Harvard College, and Allston Burr Senior Tutor in Dudley House, died on July 24, 1992, at the age of 51. Born in Berwick, Pennsylvania, he earned his B.A. in 1962 from Wesleyan University and his A.M. in medieval social history from Harvard in 1963. Intending to pursue a Ph.D., he became a Resident Tutor in History in Lowell House and thereafter entered full-time administrative service. As Allston Burr Senior Tutor, he was devoted to Dudley House and its community of

nonresident undergraduates. As Secretary of the Faculty of Arts and Sciences, he became a master craftsman of the minutes of Faculty meetings. He also rendered long service to the Administrative Board of Harvard and Radcliffe Colleges, the disciplinary body for undergraduates, and was a trusted counselor to hundreds of students over the years. He served a term as a trustee of his alma mater, Wesleyan, and also served as the first chairman of Sanctuary, a Cambridge-based drug education, research, and counseling project. He was a member of the Medieval Academy of America, the Signet Associates, and the Commanderie de Bordeaux.

Edward Sagendorph Mason, Lamont University Professor, *Emeritus*, and former Dean of the Graduate School of Public Administration, died on February 29, 1992, at the age of 91. Born in Clinton, Iowa, he received his B.A. from the University of Kansas in 1919, his A.M. from Harvard in 1920, his B.Litt. from Oxford in 1923, and his Ph.D. from Harvard in 1925. He became Professor of Economics in 1937, the George F. Baker Professor in Economics in 1940, and the Lamont University Professor in 1961. During his deanship of the Graduate School of Public Administration, from 1947 to 1958, he instituted the mid-career master's degree program in public policy and management, which now bears his name, and he supported the development of the Harvard Institute for International Development. During World War II, he served in the Office of Strategic Services and the State Department, and took part in the formation of the United Nations and the Marshall Plan, accompanying Secretary of State George C. Marshall to the Moscow conference. He also served on commissions for Presidents Truman, Eisenhower, Kennedy, and Johnson, and was a consultant to the World Bank. An authority on industrial organization and international economic development, he was coauthor of *The World Bank Since Bretton Woods* and *The Economic and Social Modernization of the Republic of Korea*, among other works. A collection of essays, *Industrial Organization and Economic Development*, was published in his honor in 1970. He received an honorary degree from Harvard in 1948.

John Bowras Matthews, Jr., Joseph C. Wilson Professor of Business Administration, *Emeritus*, died on December 22, 1991, at the age of 69. He received his B.A. degree from Bowdoin College in 1943, and his M.B.A. and D.C.S. degrees from Harvard Business School in 1949 and 1957. Professor Matthews joined the Business School as an instructor after receiving his M.B.A. and rose through the faculty ranks to become Professor of Business Administration in 1966 and Joseph C. Wilson Professor of Business Administration in 1978. An authority on ethical issues and social responsibility, he was coauthor of *Policies and Persons*, a casebook on business ethics; *Business, Society, and the Individual*; and *Marketing: A Contemporary Analysis*. He served as chairman of the Templeton College Advanced Managers Program at Oxford University for two years, and as educational director of the Institute for Administrative Leadership for more than two decades.

Daniel Miller, Clinical Professor of Otolaryngology, *Emeritus*, died on October 15, 1991, at the age of —. He received his bachelor's degree in 1933 and his medical degree in 1939, both from Tufts University. His Harvard career began with his appointment as Assistant in Otology in 1945, and culminated with his appointment as Clinical Professor of Otolaryngology in 1980. He served as chief of otolaryngology at New England Deaconess Hospital, and later as chief of the Head and Neck Oncology Clinic at Dana-Farber Cancer Institute. An authority on the treatment of head and neck cancer through induction chemotherapy, he was president of the American Society for Head and Neck Surgery and a recipient of the Newcomb Award from the American Laryngologic Association.

Tazuko Ariko Mosaki, Professor of Japanese Language and Director of the Japanese Language Program, died on January 3, 1991, at the age of 51. A native of Japan, she attended Kobe College before completing her B.A. at Rockford College in 1962. She received an M.A. from the University of Michigan in 1963, and a Ph.D. from Georgetown University in 1971. From 1971 to 1985, she was a member of the faculty at the University of Hawaii at Hilo, where she received the Award for Excellence in Teaching and twice chaired the Department of Languages. She began her service to Harvard as Visiting Professor of Japanese in 1983–84. She became Professor of the Practice of the Japanese Language in 1985, and was appointed Professor of Japanese Language and Director of the Japanese Language Program in 1988. Among her published works are *Goodbye to English Language Anxiety* (in Japanese) and *Japanese Made Easy*.

Norman Thomas Newton, Charles Eliot Professor of Landscape Architecture, *Emeritus*, died on September 12, 1992, at the age of 94. Born in Corry, Pennsylvania, he received his B.A. in 1919 and his Master in Landscape Design in 1920, both from Cornell University. He joined the Harvard faculty in 1929 as Assistant Professor of Landscape Architecture in the Graduate School of Design. He became a full professor in 1937 and was named Charles Eliot Professor of Landscape Architecture in 1963. He served as long-time chairman of the Department of Architectural Sciences, as well as Secretary of the Faculty of Design. He was president of the American Society of Landscape Architects for four years and received its highest award, the ASLA Medal, in 1974. Among his works is *Design on the Land*, published in 1971. His design projects included the master plans for Saratoga Battlefield National Historical Park, the Salem Historic Site, and the park on Liberty Island, site of the Statue of Liberty.

Clarence Bentley Nickerson, Professor of Business Administration, *Emeritus*, died on May 5, 1991, at the age of 84. Born in Quincy, Massachusetts, he received a B.B.A. from Boston University in 1928, an M.B.A. from Harvard in 1930, and a D.C.S. from Harvard in 1935. He became Assistant Professor of Accounting in 1935, Professor of Accounting in 1946, and Professor of Business Administration in 1960. He received the Business School's Distinguished Service Award in 1987 in recognition of his achievements as teacher, author, and counselor. An authority on

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managerial accounting and control, he was widely known for his book *Accounting Handbook for Non-Accountants*. He served as advisor to the Institute of Business Administration in Istanbul from 1961 to 1963 and also taught in management programs in Pakistan, Iran, Great Britain, and Holland.

Francis Marion Pipkin, Frank B. Baird, Jr. Professor of Science, died on January 2, 1997, at the age of 66. Born in Marianna, Arkansas, he received his B.A. from the University of Texas in 1951 and his Ph.D. from Princeton in 1954. He came to Harvard as a junior fellow in the Society of Fellows that same year, and was appointed Assistant Professor of Physics in 1957. He became Professor of Physics in 1963 and was named to the Baird Professorship in 1976. He served in the Army during World War II as a private in the 104th Infantry Regiment, and was awarded the Purple Heart and the Bronze Star for his service in Germany. Professor Pipkin taught and conducted research in both low- and high-energy physics. He was Associate Dean of the Faculty of Arts and Sciences for Harvard and Radcliffe Colleges from 1974 to 1976, and chairman of the Physics Department from 1985 to 1988. Professor Pipkin was active in the planning, construction, and operation of the Cambridge Electron Accelerator in the 1960s and early 1970s, and also worked on particle physics experiments at the Fermi National Accelerator Laboratory in Batavia, Illinois, and at the Synchrotron Laboratory at Cornell.

Roger Randall Dougan Revelle, Richard Saltonstall Professor of Population Policy, *Emeritus*, died on July 15, 1991, at the age of 82. Born in Seattle, Professor Revelle graduated from Pomona College in 1929, and received a doctorate in oceanography in 1936 from the University of California at Berkeley. During World War II, he served as a Navy commander in charge of the oceanographic section of the Bureau of Ships. He came to Harvard after helping found the San Diego campus of the University of California and serving as director of its Scripps Institution of Oceanography. He was also dean of research for the University of California. In 1959, Professor Revelle served as president of the first International Oceanographic Congress at the United Nations. In 1963 he received the Agassiz Medal of the National Academy of Sciences. In 1964 he came to Harvard as Richard Saltonstall Professor of Population Policy and director of the Center for Population Studies in the School of Public Health. He assumed *emeritus* status in 1978. In 1989 he led a group of scientists to Ethiopia.

Anne Roe, Professor of Education, *Emerita*, died on May 24, 1991, at the age of 80. Born in Denver, Professor Roe graduated with a B.A. in 1932 and an M.A. in 1933 from the University of Denver, and with a Ph.D. from Columbia University in 1937. She became a Lecturer on Education and Research Associate in Education in 1950, and served as Professor of Education from 1963 to 1967, when she assumed *emerita* status. She was the first woman member of the Faculty of Education to hold the rank of Professor. She also served as the first director of the Center for Research in Careers at the School of Education. Her published works included *The Making of a Scientist* (1952) and *The Psychology of Occupations* (1956). She served as president of

the New England Psychological Association and of the clinical division of the American Psychological Association.

Albert Martin Sacks, Dane Professor of Law and former Dean of the Faculty of Law, died on March 23, 1992, at the age of 76. Professor Sacks was born in New York City. He graduated from the City College of New York in 1940. After designing and administering psychological tests in the Army during World War II, he graduated in 1948 from the Law School, where he was president of the *Harvard Law Review*. He clerked for Judge Augustus Hand of the U.S. Court of Appeals for the Second Circuit in New York, and for Justice Felix Frankfurter of the U.S. Supreme Court. He became Assistant Professor of Law in 1952, Professor of Law in 1955, Associate Dean in 1968, and Dane Professor of Law in 1969. He became Dean of the Faculty of Law in 1971, and served in that position for the following decade. His tenure as dean was marked by numerous accomplishments, including the development of a required course on professional responsibility and the establishment of the Law School's Office of Clinical Programs and of its legal services center in Jamaica Plain. Coauthor of a seminal text entitled *The Legal Process*, he was an authority on constitutional law, federal jurisdiction and procedure, and legal education.

Richard Schatzki, Associate Clinical Professor of Radiology, *Emeritus*, and former Radiologist to the University Health Services, died on January 19, 1992, at the age of 90. Dr. Schatzki was born in Germany and received his medical degree from the University of Berlin in 1925. Following training in various hospitals, including University Hospital in Frankfurt, he worked as a professor of radiology in Leipzig for several years. In the United States, Dr. Schatzki joined the staff of the Massachusetts General Hospital. After serving in the Army during World War II, he became radiologist-in-chief at Mount Auburn Hospital, where he helped develop Mount Auburn into one of Harvard Medical School's main teaching hospitals. He became Assistant Clinical Professor of Radiology and Radiologist to the University Health Services in 1961 and Associate Clinical Professor of Radiology in 1964. He worked until the age of 82, and in 1984 the radiology department at Mount Auburn Hospital was named for him. He served as president of the New England Roentgen Ray Society and vice president of the American Roentgen Society. His honors included the Walter Cannon Medal awarded by the Society of Gastrointestinal Radiology.

Judith Nisse Shklar, John Cowles Professor of Government, died on September 15, 1992, at the age of 63. Professor Shklar was born in Riga, Latvia, and came to this continent after World War II. She received her bachelor's and master's degrees from McGill University in 1949 and 1950, and her doctorate from Radcliffe College in 1955. An eminent political theorist, she became Assistant Professor of Government in 1959, a member of the Faculty of Public Administration in 1960, Professor of Government in 1972, and John Cowles Professor of Government in 1979. She received a MacArthur Foundation fellowship in 1984. Professor Shklar

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was awarded the Phi Beta Kappa Teaching prize in 1985. Her last book, *American Citizenship: The Quest for Inclusion* (1991), was based on the Tanner Lectures she delivered at the University of Utah. Her other published works included *Political Theory and Ideology* (1966), *Freedom and Independence* (1976), *Ordinary Vices* (1984), and *The Faces of Injustice* (1990). She was the Carlyle Lecturer at Oxford University in 1986, and served in 1989–90 as president of the American Political Science Association. She was also a senior fellow of the Harvard Program in Ethics and the Professions.

Franklin Faust Snyder, Associate Professor of Anatomy and Obstetrics, *Emeritus*, died on June 9, 1992, at the age of 94. Born in Lancaster, Pennsylvania, Dr. Snyder received his bachelor's degree from Princeton in 1919, and his medical degree from Johns Hopkins University in 1923. He came to Harvard after service on the faculties of the University of Rochester Medical School, Johns Hopkins, and the University of Chicago Medical School. An authority on fetal respiration, he served at Harvard as Associate Professor of Anatomy and Obstetrics from 1942 until his retirement in 1964. His research included studies of the effect of drugs in fetal and maternal circulation, and of the changes that occur in the Fallopian tubes during the menstrual cycle.

Louis Francis Solano, Professor of Romance Languages, *Emeritus*, died on August 9, 1992, at the age of 88. Born in Naples, Professor Solano graduated from Harvard College in 1924. He received a master's degree from Harvard in 1925, and a doctorate in 1931. He studied paleography in 1928–29 as a Sheldon Traveling Fellow in Paris. He became an Instructor in Romance Languages in 1925, Associate Professor of Romance Languages in 1940, and Professor of Romance Languages in 1969. In 1968 he went to the Soviet Union and, speaking Georgian, addressed the International Congress of Soviet Writers and the Supreme Soviet of the Republic of Georgia on the poetry of Georgian Romantic poet Nikoloz Baratashvili. A frequent contributor to scholarly journals, Professor Solano was honored in 1970 in a collection of essays published by the University of North Carolina Press. He taught a wide variety of subjects, including Old French, Old Italian, Vulgar Latin, and Romance linguistics.

Barbara Miller Solomon, Distinguished Scholar in Residence at Radcliffe College and former Senior Lecturer on History and Literature and on the History of American Civilization, died on August 20, 1992, at the age of 73. She received her A.B. degree from Radcliffe College in 1940 and her Ph.D. in 1953. She taught American history and literature at Harvard from 1965 to 1985. In 1970 she became the first woman to serve as Assistant Dean of Harvard College, following service as an Associate Dean at Radcliffe. From 1959 to 1963 she directed the Women's Archives at Radcliffe College, now known as the Schlesinger Library. She was the author of a number of books, including *In the Company of Educated Women: A History of Women and Higher Education in America* (1985) and *Ancestors and Immigrants: A Changing New England Tradition* (1956).

Somers Hayes Sturgis, Professor of Gynecology, died on April 3, 1991, at the age of 86. Dr. Sturgis received his A.B. in 1927 and his M.D. in 1931, both from Harvard. He became Assistant Clinical Professor of Gynecology in 1950, Clinical Professor of Gynecology in 1956, and Professor of Gynecology at the Peter Bent Brigham Hospital in 1970, before assuming *emeritus* status in 1971. He also served for years as Gynecologist to the University Health Services. Long-time head of gynecological surgery at the Brigham, he was an authority on the endocrinology of birth control, and helped establish a psychiatry unit in the Department of Surgery for women with reproductive disorders and breast cancer. He also established a clinic at the Brigham to help patients with problems related to fertility and family planning.

Carl Waldemar Walter, Clinical Professor of Surgery, *Emeritus*, died on May 6, 1992, at the age of 86. Born in Cleveland, Dr. Walter received his A.B. in 1928 and his M.D. in 1932, both from Harvard. In 1935 he was named Arthur Tracy Cabot Fellow in Surgery, then rose through the ranks to become Clinical Professor of Surgery in 1962. He practiced surgery for decades at the Peter Bent Brigham Hospital, where he was a leading advocate for infection control in operating rooms. Dr. Walter was a pioneer in the transfusion and storage of blood and is credited with having invented the plastic bags universally used to collect and transport blood. Upon assuming *emeritus* status in 1972, he became chairman of the Harvard Medical School Alumni Fund. He received a Harvard Medal at the University's 350th anniversary celebration.

Lewis Bookwalter Ward, Professor of Business Research, *Emeritus*, died on June 8, 1992, at the age of 87. Born in India, he received his bachelor's degree in 1930 and his Ph.D. in 1934, both from Yale. After serving on the faculty of Milwaukee State Teachers College, he served in the Air Force during World War II. He became a Research Fellow, Assistant Dean, and Director of Admissions at Harvard Business School in 1946. He left Harvard for several years to serve as director of the Educational Testing Service Executive Study in Princeton, then returned to the Business School in 1959 as Professor of Business Research, the position he held until 1974. In the 1960s, he chaired an interdepartmental committee that developed a plan for providing computer facilities to the Harvard community.

Carroll Milton Williams, Bussey Professor of Biology, *Emeritus*, died on October 11, 1991, at the age of 74. Professor Williams graduated from the University of Richmond in 1937. At Harvard, he was awarded an A.M. in 1938, a Ph.D. in biology in 1941, and an M.D. in 1946. He then became Assistant Professor of Zoology, and went on to become Professor of Zoology in 1953 and Bussey Professor of Biology in 1966. An authority on hormonally active insecticides, he was a 1967 recipient of the George Ledlie Prize, given every two years to the Harvard faculty member who has made "the most valuable contribution to science or in any way for the benefit of mankind." He was a Guggenheim Fellow in 1955–56.

Edgar Bright Wilson, Jr., Theodore Williams Richards Professor of Chemistry, *Emeritus*, died on July 12, 1992, at the age of 83. Born in Gallatin, Tennessee, and raised in Yonkers, New York, Professor Wilson received his bachelor's degree from Princeton in 1930 and his Ph.D. from the California Institute of Technology in 1933. He began his long and distinguished service to Harvard in 1934 as junior prize fellow of the Society of Fellows. He became Assistant Professor of Chemistry in 1936, Associate Professor of Chemistry in 1939, Professor of Chemistry in 1946, and Theodore Williams Richards Professor of Chemistry in 1947. One of the chief architects of chemical physics, he developed the basic methods for the quantitative study of the internal motion of atoms in molecules. His work was critical to the development of both molecular spectroscopy and molecular astronomy. His many published works included the monograph *An Introduction to Scientific Research*. During World War II, he served as director of the Underwater Explosives Research Laboratory at Woods Hole, and later served briefly as research director of the Weapons Systems Evaluation Group. Harvard awarded him an honorary degree in 1983. His numerous other honors included the National Medal of Science, the Welch Award, and the Rumford Medal.

Paul Norman Ylvisaker, Charles William Eliot Professor of Education and former Dean of the Faculty of Education, died on March 17, 1992, at the age of 70. Born in Minneapolis, Professor Ylvisaker was educated at Bethany Junior College and Mankato State Teachers College, before receiving his master's and doctoral degrees from Harvard. In 1960 he accepted President Johnson's invitation to serve as chairman of the Task Force on the Cities. He went on to join the Ford Foundation's public affairs program, and was then appointed the first Commissioner of Community Affairs for the State of New Jersey. He returned to Harvard as Williams Visiting Professor in City and Regional Planning in 1968. In 1972, he became Dean of the Faculty of Education and Charles William Eliot Professor of Education. He served as Dean until 1982, and was credited with having guided the School of Education through a period of difficult financial challenge and increased concern about the condition of the nation's public schools.

Special mention is made of the following members of the Harvard community who served the University with dedication and distinction:

Buford Hugh Burdette, Assistant Clinical Professor of Oral Diagnosis and Oral Radiology, who died on August 22, 1991, at the age of 60; Herman De Wilde, former Assistant Clinical Professor of Operative Dentistry, who died on March 18, 1992, at the age of 80; Richard Galdston, Assistant Clinical Professor of Psychiatry, who died on April 12, 1992, at the age of 65; Richard W. Gange, Associate Professor of Dermatology, who died on November 13, 1991, at the age of 46; Kathryn Kris, Assistant Clinical Professor of Psychiatry, who died on December 13, 1992, at the age of 96; Sidney Seymour Lee, Visiting Professor of Health Policy in the Department of Social Medicine and Health Policy, and former Clinical Professor of Hospital and Medical Care Administration in the School of

Public Health and Associate Dean of the Faculty of Medicine for Hospital Programs, who died on November 29, 1992, at the age of 70; PATRICK GAYNOR MADDOX, Associate Director of the John K. Fairbank Center for East Asian Research, who died on September 6, 1991, at the age of 46; JOEL MARK NOY, Assistant Clinical Professor of Surgery, who died on September 13, 1991, at the age of 48; CALVIN HARMON PETER PAVA, Assistant Professor of Business Administration, who died December 17, 1992, at the age of 39; and JOHN STONE WOLFSON, Assistant Professor of Medicine, who died on October 11, 1991, at the age of 45.

Neil L. Rudenstine
President

November 1993

Lists containing all resignations accepted during the academic years 1991–92 and 1992–93, all promotions, elections to established chairs, and all appointments without limit of time voted during the academic years 1991–92 and 1992–93, as well as lists of visiting professors and lecturers, are on deposit in the office of the Secretary to the University, and in the Archives.

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